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VITAL LEARNING IN PERSON

FACE to FACE

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Gary L. Frazier

From the Incoming Editor

I am honored to be serving as editor of the *Journal of Marketing* (*JM*). I thank prior editors, editorial review board (ERB) members, ad hoc reviewers, and authors for their contributions in making *JM* a premier scholarly journal. Authors from all over the world are increasingly submitting their manuscripts to *JM* because of its large and diverse readership, impact, and status in marketing and related disciplines. I give special thanks to Ajay Kohli for his efforts as immediate past editor. His confidence in naming me a coeditor during his term and his guidance in helping me grasp what it takes to be an outstanding editor will always be greatly appreciated.

My overarching goals as editor of *JM* are to publish articles that (1) advance the science and practice of marketing and (2) serve as a bridge between the scholarly and the practical. Accordingly, I am committed to publishing a diverse array of articles centering on any topic of relevance to our discipline utilizing any method. In particular, articles that provide novel insights based on a rigorous theoretical and methodological approach with broad appeal to both academicians and practitioners will be highly valued during my editorship. My job is to ensure that knowledge development in the marketing discipline is significantly advanced through articles published in *JM*.

In reaching for these overarching editorial goals, I am focusing my efforts in achieving five specific objectives. My first objective is to ensure strong content in articles published in *JM* through effective management of the review process. For the first time, an area editor (AE) structure has been implemented at *JM*. I have named the following 21 highly regarded marketing scholars as AEs:

Kusum Ailawadi, Dartmouth College
Alexander Chernev, Northwestern University
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Connie Pechmann, University of California, Irvine
Aric Rindfleisch, University of Wisconsin–Madison
Sanjay Sood, University of California, Los Angeles
Jan-Benedict Steenkamp, University of North Carolina

Furthermore, I have assembled a stellar ERB of 130 members from around the world. Roughly one-third of ERB members are new, having demonstrated their reviewing capability in the past as ad hoc reviewers. The ERB is formally recognized on the American Marketing Association website beginning July 1 and will be listed in each issue of *JM* beginning January 2012. Finally, I am relying on the efforts of several hundred ad hoc reviewers, who are vital to the review process at *JM*.

For each paper sent out for review, I assign an AE and a combination of three ERB members and ad hoc reviewers. The AE's responsibility is to integrate reviewer comments, outline major areas of weakness, suggest ways to improve the paper, and provide an overall recommendation on the paper to me. I make the final editorial decision on each paper. Utilizing the expertise of AEs in specific content and method areas of our discipline leads to enhanced editorial decisions and truly meaningful guidance to authors on how the content of their papers can be improved (e.g., clarifying incremental contributions relative to extant research, providing more precise conceptual definitions of constructs, making theoretical arguments in a more convincing manner, enhancing the validity of experiments, strengthening operational measures). Of course, an effective review process rests on the dedicated efforts of ERB members and ad hoc reviewers for high-quality reviews.

My second objective is to publish more theory articles in *JM*. High-quality articles that develop new theories and concepts are important to the intellectual vibrancy of any academic discipline. I am especially interested in the development of "organic marketing theories," in which marketing scholars construct new theories about marketing phenomena rather than merely apply established theories developed in the so-called basic disciplines to the marketing domain. Marketing is much more than an applied field, in that we focus on problems and constructs in unique ways. I want to publish theory articles that reflect this viewpoint. Review papers and qualitative or ethnographic papers are encouraged as long as they develop new concepts and/or theoretical propositions.

For the first time, we have created a theory development editor (TDE) structure at *JM*. I have named Ajay Kohli, Georgia Institute of Technology, and Debbie MacInnis, University of Southern California, as TDEs. When I receive theory papers with promise but in need of additional refinement before being sent out for review, I offer authors the option of having a TDE review them. In such cases, the

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TDE reviews the paper and provides detailed feedback to the authors on how it can be improved. Authors have the opportunity to significantly revise their papers according to this feedback before submitting them back to *JM*. This process will enhance the likelihood of theory articles being published in *JM* and also send clear signals to marketing faculty and practitioners about the importance of theory articles.

My third objective is to increase the diversity of authors publishing articles in *JM*. I want talented authors from all over the world to submit their papers to *JM*. I especially encourage emerging scholars to consider the value of publishing their articles in this journal. In my experience, assistant professors often submit to more specialized journals, waiting to send papers to *JM* until later in their professional careers. Such a publishing strategy is unnecessary. If the research addresses an important problem and offers novel and valid insights, I want it to be published in *JM*. Important managerial implications will be apparent in such papers.

My fourth objective is to ensure that every author believes the review process at *JM* is fair and beneficial. When I desk-reject a paper, I write a decision letter to the authors explaining why. When I send a paper out for review, I ask for constructive reviews from the AE and the reviewers. After receiving input from the review team, I write the letter to the authors explaining the basis for the editorial decision. Regardless of that decision, I want the process to provide guidance to authors on how they can improve their papers. If authors see fairness in the review process and its value, they are more likely to submit their research to *JM* in the future. I intend for collegiality and respect for authors' dignity to characterize the review process at *JM*.

My fifth and final objective is to make *JM* more accessible to practitioners. I work with authors to make the titles of their papers both descriptive and captivating. Moreover, I work with authors to ensure the abstracts and discussion sections of their papers focus on novel theoretical, substantive, and managerial insights from the research, written in clear and understandable terms.

In conclusion, I am excited to be editor of *JM*. The job is truly demanding, but I am ready for the challenge. It is a distinct privilege to be involved in fostering knowledge development in marketing along with all the AEs, ERB members, ad hoc reviewers, and authors that make this possible.

GARY L. FRAZIER
Editor-Elect

Timothy B. Heath, Devon DelVecchio, & Michael S. McCarthy

The Asymmetric Effects of Extending Brands to Lower and Higher Quality

Managers often extend brands to different quality levels (e.g., Charmin's lower-quality Charmin Basic), which may increase sales but risks diluting brand image. This study examines such line extensions by testing middle-quality brands (e.g., Giovanni's pasta sauce [fictitious], Foster's beer [real]) that offer higher-quality (e.g., Giovanni's Magnifico) or lower-quality line extensions (e.g., Foster's Grog). A robust asymmetry emerges in which higher-quality extensions improve brand evaluation far more than lower-quality extensions damage it. The asymmetry prevails across various perceptual and evaluative dimensions, multiple product classes, numerous fictitious and real brands that differ on various dimensions (familiarity, liking, personality, and prestige), and consumer regulatory focus. Group and individual-level tests show that the standard asymmetry is the modal pattern (though not universal) and that it is associated with two primary underlying processes: (1) opponent processes produced by lower-quality extensions whose negative quality-association effects are tempered by positive variety effects (in general, consumers prefer broader product lines) and (2) best-of-brand processing, in which consumers consider higher-quality extensions more relevant to brand evaluation than lower-quality extensions.

Keywords: brands, brand management, line extensions, product lines, brand evaluations

Companies commonly extend product lines horizontally within the same price/quality level (e.g., Ragu's many flavors of pasta sauce) and vertically across different price/quality levels (e.g., Toyota's higher-quality Avalon; Draganska and Jain 2005). Such line extensions increase brand visibility, appeal to diverse consumer tastes, and thus help brands outsell existing competitors while discouraging new ones (Quelch and Kenny 1994), though they also risk diluting the brand's reputation. Vertical line extensions to lower-quality are especially dangerous because they threaten to taint the brand's otherwise higher-quality image (e.g., Janiszewski and Van Osselaer 2000). However, despite such threats, line extensions to lower quality have become popular as higher-quality brands try to attract value shoppers for items ranging from the everyday (e.g., Bounty Basic paper towels, Levi Strauss Signature jeans) to the prestigious (e.g., Marc by Marc Jacobs designer clothing, BMW 1-Series automobiles). Nonetheless, theory and research on vertical line extensions is sparse and has produced inconsistent results. Therefore, the current study reviews and develops theory on vertical line extensions and then tests that theory by documenting various positive and negative consumer responses to such extensions and their net effect on overall brand evaluation.

Although line extensions signal brand success and target diverse market segments, so too do they risk diluting brand image (Dacin and Smith 1992; Kapferer 2004). Potential negative image effects are epitomized by brand extensions to different but ill-fitting product categories (e.g., Cheetos lip balm) in which they can dilute brand image, damage evaluations of the new product, and even harm evaluations of the brand in its original category (Aaker and Keller 1990; Ahluwalia 2008; Balanchander and Ghose 2003; DelVecchio and Smith 2005; John, Loken, and Joiner 1998; Milberg, Park, and McCarthy 1997; Zimmer and Bhat 2004; see Loken, Joiner, and Houston 2010). Not surprisingly, therefore, research on line extensions in existing product categories reveals varied effects. Empirical models indicate that broader product lines are often associated with more profit (e.g., Kekre, Sunder, and Srinivasan 1990), whereas behavioral studies report positive consumer responses to horizontal line extensions (e.g., Berger, Draganska, and Simonson 2007) but mixed responses to vertical line extensions (e.g., Kirmani, Sood, and Bridges 1999).

We report three studies (in addition to a follow-up to Study 1) that assess vertical line extensions in greater depth by studying consumer responses to middle-quality brands that offer lower- or higher-quality extensions. Across various brands, product classes, and prospective moderators, a robust asymmetry emerges: Higher-quality line extensions improve overall brand perception and evaluation more than lower-quality extensions damage them, and the latter often have no effect.

Because this is the first known demonstration of line-extension asymmetries, we hope to lay as solid a foundation for their study as possible by exploring various potential explanations. Two such accounts stand out both theoretically and empirically: (1) Lower-quality extensions produce

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opponent processes in which any negative effects of associating the brand with lower quality are tempered by positive effects of offering more brand versions (because consumers often prefer broader product lines), and (2) consumers consider higher-quality line extensions more relevant to brand evaluation than lower-quality extensions.

Prior Extension Research

The considerable research on brand extensions to new product categories has sometimes included extensions to different quality levels, though the results are inconsistent. Ahluwalia and Gurhan-Canli (2000) report a pattern across extension fit and information accessibility conditions that might be expected a priori: Higher-quality brand extensions have neutral to positive effects on brand evaluation, whereas lower-quality extensions have neutral to negative effects. Loken and John (1993) similarly find that lower-quality extensions reduced brand evaluation regardless of brand fit with the new category. In contrast, Romeo (1991) reports that lower-quality extensions did not alter brand evaluation in high fit and even improved it in low fit, and Zimmer and Bhat (2004) report neutral to positive effects across brand extensions of varying quality levels and fit. Finally, Keller and Aaker (1992) find that both unsuccessful and successful intervening (earlier) extensions (which may correspond to lower- and higher-quality extensions) improved brand evaluation relative to proposed-extension-only control conditions. Thus, higher-quality brand extensions have tended to produce neutral to positive responses, whereas lower-quality brand extensions have produced responses ranging from negative to positive.

The more scant research on line extensions in existing product categories eliminates effects of brand fit with new product categories but also finds inconsistent results, in which generally, horizontal (same quality) line extensions seem to help (Berger, Draganska, and Simonson 2007; Draganska and Jain 2005; Kadiyali, Vilcassim, and Chintagunta 1999; Kekre and Srinivasan 1990; Reddy, Holak, and Bhat 1994; Robinson and Fornell 1985). For example, Berger, Draganska, and Simonson (2007) report that more flavors of chocolate improved perceived brand expertise and choice and even perceived taste.

In contrast, vertical line extensions have produced mixed results the few times they have been studied. Randall, Ulrich, and Reibstein (1998) find that a bicycle brand's quality levels were sometimes correlated with a price-based brand-equity proxy but that the number of product versions within a product line was negatively correlated with that proxy. Lei, De Ruyter, and Wetzels (2008) report one small test of overall brand evaluation in which a higher-quality extension improved brand evaluation, whereas a lower-quality extension reduced it. Kirmani, Sood, and Bridges's (1999) pioneering line-extension tests of nonowners versus owners of two automobile brands indicate ownership effects but also some irregularities across ownership, brand, and extension price. Compared with when the brand offered a lower-priced extension, higher-priced extensions led (1) BMW owners to rate BMW higher, (2) BMW nonowners to rate BMW lower, (3) Acura owners to rate Acura the same, and (4) Acura nonowners to rate Acura higher. As the authors note, although differential prestige may have contributed to cross-brand differences, Acura, not just BMW, may have enjoyed some prestige.

In summary, research has concluded that the effects of horizontal line extensions have been positive whereas those of vertical line extensions have varied, variance that may have arisen from methodological differences in addition to affordability effects. Randall, Ulrich, and Reibstein (1998) use a proxy (not actual) brand equity measure that was tested with correlational methods within cross-sectional data such that causal direction is not clear (e.g., brands lower in brand equity may have expanded their lines as a potential remedy). Moreover, Kirmani, Sood, and Bridges (1999) (1) do not include the no-extension control groups necessary to determine whether extension effects were produced by the higher-priced extensions, lower-priced extensions, or both, and (2) in the tests of overall brand evaluation relevant to the current study, they assess only two automobile brands at different price points that risked unwanted affordability effects (e.g., non-BMW owners may have responded negatively to BMW's higher-priced extension because they considered it financially unreachable). Furthermore, across the various studies, researchers assessed different ranges of line-extension price/quality points. Therefore, we test the effects of vertical line extensions using real and fictitious middle-quality brands that are in general affordable and offer higher- or lower-quality line extensions whose price/quality distance from the original brand is controlled.

Theory

Three broad psychological processes are likely contributors to vertical line-extension effects on overall brand evaluation: quality associations, variety effects, and perceived extension relevance to brand evaluation. First, offering higher-quality extensions associates the brand with better products and should thus improve overall brand evaluation, whereas lower-quality extensions should do the opposite (see Aaker 1996; Gurhan-Canli and Maheswaran 1998; Loken and John 1993). For example, Janiszewski and van Osselaer (2000) report that brand evaluation is positively correlated with the average quality offered across a brand's various options.

Second, because offering greater variety at the same quality level has positive effects (variety effects; Berger, Draganska, and Simonson 2007), offering greater variety at other quality levels is likely to do so as well. Young & Rubicam recently updated its Brand Asset Evaluator to include a new, fifth pillar of brand equity dubbed "brand energy." Brand energy consists of brand innovativeness and dynamism, in which perceived innovativeness is driven by "new product introductions, line extensions, new inventions, and breakthroughs" (Mizik and Jacobson, 2008, p. 17). In a study of 275 major brands, only two Brand Asset Valuator pillars, one of which was brand energy, explained variance in stock returns beyond that explained by standard accounting measures.

Thus, higher-quality extensions should produce positive quality-association and positive variety effects that jointly improve brand evaluation, whereas lower-quality extensions should produce offsetting negative quality-association and positive variety effects (opponent processes) that yield more neutral effects Opponent processes then predict a line-extension asymmetry in which higher-quality extensions help brands more than lower-quality extensions hurt

Third, higher-quality extensions may be more relevant to brand evaluation than lower-quality extensions because the brand's highest-quality version signals brand capability or expertise, (i e , the ability to produce high-quality products and services) Such best-of-brand processing also predicts an asymmetry favoring higher-quality extensions By increasing the brand's highest quality level, higher-quality extensions signal greater brand expertise and should therefore improve brand evaluation In contrast, by leaving the brand's highest quality level unchanged, lower-quality extensions signal no change in brand expertise (merely the choice not to exercise that expertise in the extension) and should therefore affect brand evaluation less

The studies we report consistently indicate the predicted asymmetry in which higher-quality extensions improve brand perception and evaluation more than lower-quality extensions damage them, where process results evidence both opponent processes and best-of-brand processing Study 1's tests of fictitious brands find the predicted asymmetry and support opponent processes Lower-quality line extensions damage brand prestige but improve perceived brand innovativeness Study 1's follow-up study and Study 2 replicate and extend these findings to actual brands, and Study 2 also tests three additional factors (1) perceived relevance of lower- and higher-quality extensions, (2) brand personality richness, and (3) consumer regulatory focus The asymmetry proves robust, transcending both brand personality and consumer regulatory focus, and consumers consider higher-quality line extensions positive and important to brand evaluation but lower-quality extensions neutral and somewhat irrelevant Study 3 extends the between-subjects methods of Studies 1 and 2 to a within-subject test that assesses asymmetries with (1) direct measures of opponent processes and (2) more symbolic brands—those that may suffer more from lower-quality extensions The results indicate that lower-quality extensions produce opposing quality-association and variety effects among some consumers, but among others, best-of-brand processing prevails, in which lower-quality extensions are largely irrelevant Study 3 also replicates the line-extension asymmetry in the aggregate and reveals that it can be the opposition within a minority of individual consumers Thus, symbolic brands may temper the standard line-extension asymmetry but fail to eliminate its modal pattern

General Methodology

Four studies (including Study 1's follow-up study) tested ostensibly unknown (fictitious) and/or known middle-quality (hereafter, "flagship") brands that, in experimental conditions, also offered lower- or higher-quality line extensions equidistant from flagship price/quality levels Middle-quality brands produced average brand attitudes in control conditions (see Ahluwalia and Gurhan-Canli 2000) that thereby reduced potential contamination from floor and ceiling effects on brand evaluation In pretests, fictitious to-be-evaluated brand names were liked moderately, real brands were rated average in quality, and lower- and higher-quality extension names were rated equally negatively and positively, respectively

We enlisted a product-naming system to emulate marketplace line-extension perceptions For example, Study 1's fictitious Giovanni's middle-quality pasta sauce sometimes offered the higher-quality Giovanni's Magnifico and at other times the lower-quality Giovanni's Basiqué This system mimics marketplace conventions (e g , Charmin offering Charmin Basic, Charmin, and Charmin Ultra) and signals that the middle-quality version is the flagship version that offers variations in the form of line extensions that receive the flagship's name in addition to a quality-consistent descriptor The view that the middle-quality version is the flagship brand was fueled further by using real brands (e g , Foster's beer) whose middle-quality versions were longstanding, well-known brands and whose additional (fictitious) versions were new to consumers Fictitious middle-quality brands produced the same patterns as real middle-quality flagship brands, in support of the idea that participants viewed fictitious middle-quality brands as flagships

We used various procedures to stimulate engagement and emulate the marketplace First, the studies enlisted product classes relevant to the undergraduate and graduate students tested (pasta sauces, portable CD players, beers, clothing stores, e g , 85% reported regularly purchasing pasta sauce) To motivate encounters with the brands, we prompted participants to imagine taking a job far from their university where they were evaluating local brands within that market To emulate the market's price–quality tradeoffs while allowing brands to exist at various quality levels, we showed participants a table with brand names, prices, and average quality ratings from the store's customers or from a local newspaper (e g , 5 of 7 stars)

Line extensions might affect hundreds of dimensions (e g , perceived brand earnestness, intelligence, aggressiveness), but a census of such dimensions is impractical All studies reported here measured at least four outcome dimensions and their effects fundamental to brand evaluation and image and likely to be influenced by line extensions attitude toward the overall brand, perceived brand expertise, brand prestige, and brand innovativeness (e g , Aaker 1997, Broniarczyk and Gershoff 2003, Brown and Dacin 1997, Park, Milberg, and Lawson 1991) We assessed brand attitude because it is the most fundamental indicator of brand evaluation, perceived expertise because prior research has reported that brand variety can signal expertise (Berger, Draganska, and Simonson 2007), perceived prestige because it is especially sensitive to product quality and thus well-suited to detecting any negative quality-association effects produced by lower-quality extensions (Mason 1981, Park, Jaworski, and MacInnis 1986), and perceived innovativeness because variety should signal the creativity necessary to generate and market new ideas (Mizik and Jacobson 2008, Ouellet 2006) The expertise and innovativeness measures were also important because they offered the promise of detecting positive effects of lower-quality extensions, thus demonstrating that such extensions can produce opponent processes at the level of brand evaluation such as negative effects on perceived brand prestige but positive effects on perceived brand innovativeness Finally, the expertise measure was important because it tested best-of-brand processing's prediction that higher-quality extensions would improve perceived brand expertise whereas lower-quality extensions would have no effect

Study 1: Opponent Processes

Method

Two-hundred forty-eight juniors and seniors at a large U S university were randomly assigned to experimental conditions A line-extension quality (control plus six experimental conditions) × product-class (pasta sauce, portable CD players) × target-name (two names counterbalanced per product class) between-subjects design tested the effects of five brand-quality levels (e g , 3–7 stars in pasta sauce) Flagship brands were Giovanni's and Formaggio's in pasta sauce and Acoustix and Earshot in CD players In addition to the flagship product offered at, for example, 5 of 7 quality stars in control conditions, the six experimental conditions added (1) a line extension one level up (one more star) in quality (Up-1, e g , Giovanni's Tuscano), (2) a line extension two levels up in quality (Up-2, e g , Giovanni's Magnifico), (3) extensions at both one and two levels up (Up-1, 2), (4) an extension one level down in quality (Down-1, e g , Giovanni's Naturalé), (5) an extension two levels down in quality (Down-2, Giovanni's Basiqué), and (6) extensions at both one and two levels down (Down-1, 2) Participants imagined taking a position in Bath, England, where they were shopping and encountering brands summarized by a table To standardize frames of reference across participants, they rated the target brand relative to a comparator brand at the same price/quality level through questions of the following form "Please compare your impressions of the Formaggio's and Giovanni's brands of pasta sauce on the following dimensions and circle the boxes that best reflect your views Ability to Make a Good Pasta Sauce (Formaggio's is Much Better than Giovanni's, Formaggio's is Somewhat Better than Giovanni's, etc), Creativity (scale levels), I Like (scale levels) " Twelve such seven-point items measured four constructs brand attitude (liking, favorableness, and brand strength, standardized $\alpha = 85$), prestige (prestige, sophistication, and elegance, standardized $\alpha = 87$), expertise (expertise, ability, and competence, standardized $\alpha = 83$), and innovativeness (innovativeness, creativity, and imaginativeness, standardized $\alpha = 81$)

Results

We subjected composite measures (means) of the four outcome dimensions to line-extension by product-class by target-name analyses of variance (ANOVAs, see Table 1 and Figure 1) For each measure, we used a general ANOVA to test the main effect of line extension and any interactions Then, we ran an "asymmetry" ANOVA on only the experimental conditions, in which we transformed the dependent variable as follows the rating minus the corresponding control condition mean for participants in higher-quality-extension conditions, and the control condition mean minus the rating for participants in lower-quality-extension conditions Thus, the asymmetry ANOVAs compared the amount of improvement produced by higher-quality extensions with the amount of damage produced by lower-quality extensions Although asymmetries could be tested for each quality-condition pairing (e g , Up-1 vs Down-1, Up-2 vs Down-2), reporting three separate analyses for each construct produces tedious and redundant results Therefore, we report only those comparing all higher-quality-extension with all lower-quality-extension conditions

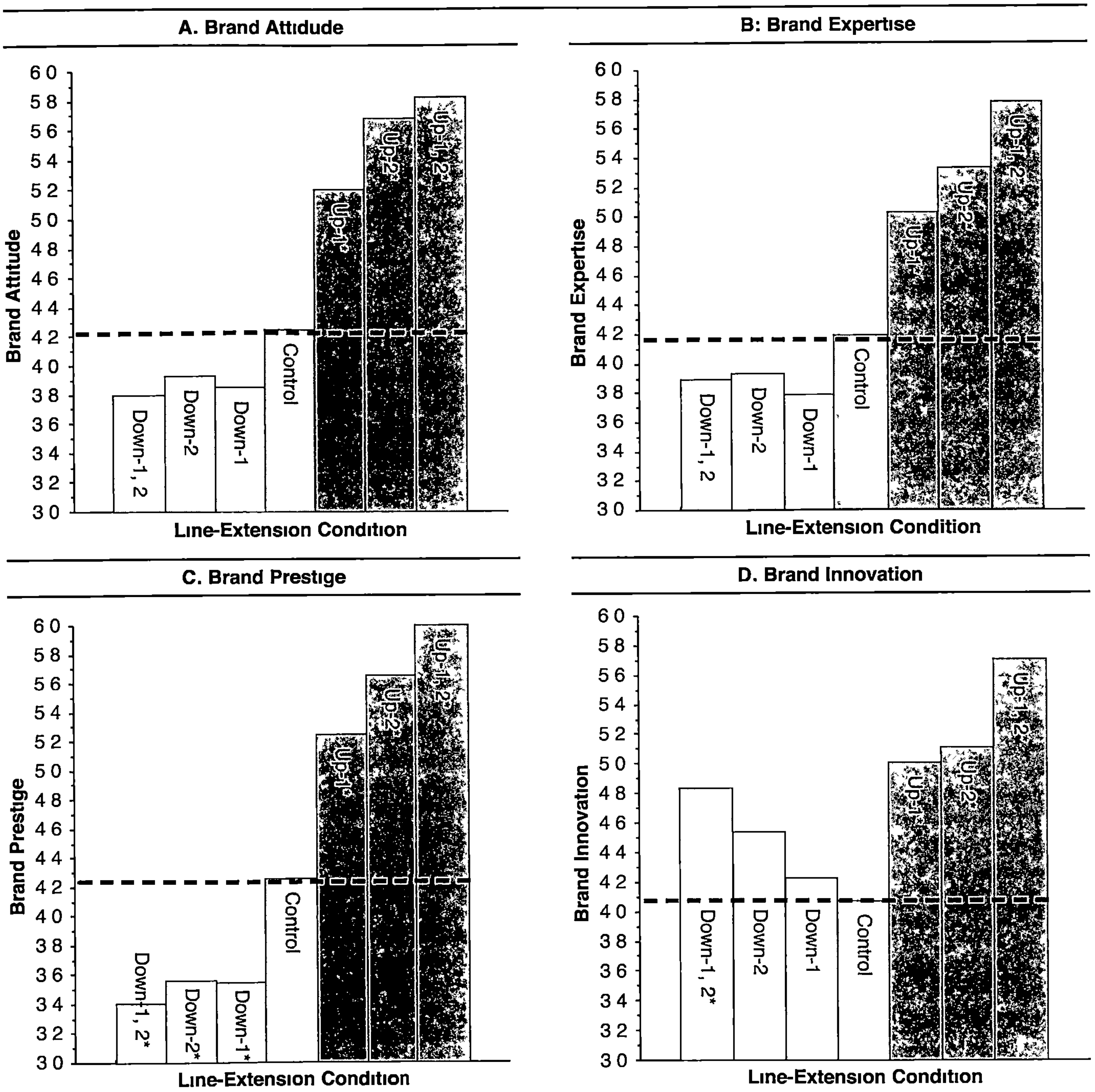
Differential effects on brand attitudes and perceptions Line-extension quality altered brand attitudes ($F(6, 220) = 41 50, p < 001$) and perceived brand expertise ($F(6, 220) = 39 42, p < 001$), prestige ($F(6, 220) = 64 65, p < 001$), and innovativeness ($F(6, 220) = 15 60, p < 001$) Figure 1's darker gray bars show that higher-quality extensions consistently improved brand evaluation and perception across all four measures However, consistent with the predicted line-extension asymmetry, Figure 1's lighter gray bars show that

TABLE 1
Study 1 Brand Ratings

	Brand Quality Conditions						
Dimension	**Down-1, 2**	**Down-2**	**Down-1**	**Control**	**Up-1**	**Up-2**	**Up-1, 2**
Pasta Sauce							
Brand attitude	3 73 (17)	4 06 (17)	4 04 (19)	4 43 (18)	5 17 (20)	5 44 (18)	5 78 (17)
Brand prestige	3 65 (17)	3 55 (17)	3 56 (19)	4 50 (18)	5 35 (20)	5 52 (18)	6 00 (17)
Brand expertise	4 06 (17)	3 98 (17)	3 88 (19)	4 28 (18)	5 10 (20)	5 17 (18)	5 78 (17)
Brand innovativeness	5 18 (17)	4 78 (17)	4 54 (19)	4 00 (18)	4 85 (20)	4 68 (18)	5 96 (17)
CD Players							
Brand attitude	3 87 (18)	3 79 (16)	3 62 (16)	4 06 (17)	5 22 (18)	5 88 (20)	5 88 (17)
Brand prestige	3 17 (18)	3 56 (16)	3 51 (16)	4 00 (17)	5 15 (18)	5 77 (20)	6 02 (17)
Brand expertise	3 72 (18)	3 87 (16)	3 67 (16)	4 10 (17)	4 94 (18)	5 50 (20)	5 78 (17)
Brand innovativeness	4 50 (18)	4 27 (16)	3 85 (16)	4 16 (17)	4 85 (18)	5 50 (20)	5 43 (17)

Notes All ratings are on seven-point scales (n's in parentheses) Control = single flagship brand, Down-1 = flagship plus extension one level down in quality, Down-2 = flagship plus extension down two levels in quality, and so on

FIGURE 1
Study 1: Asymmetric Effects of Lower-Quality and Higher-Quality Extensions Where the Former Produces Opponent Processes



Notes * = significant difference from control (*p* < 003, Dunnett's tests) Target brands in control conditions offered a single middle-quality product, whereas target brands in experimental conditions offered that same product plus the following line extensions Down-1 = line extension one step down in quality, Down-2 = line extension two steps down in quality, Down-1,2 = both lower-quality extensions, Up-1 = line extension one step up in quality, Up-2 = line extension two steps up in quality, and Up-1,2 = both higher-quality extensions

lower-quality extensions failed to consistently produce correspondingly negative effects In Figure 1's top two panels, lower-quality extensions failed to significantly alter brand attitudes or perceived brand expertise However, comparing lighter gray bars across Figure 1's bottom two panels shows that lower-quality extensions reduced brand prestige but increased perceived brand innovativeness, opponent processes that might account for the null effect of lower-quality extensions on brand attitudes (tested subsequently)

Asymmetry ANOVAs showed that effects on all four measures were asymmetric across higher- and lower-quality extensions Two examples illustrate the general pattern First, higher-quality extensions improved brand attitudes more than lower-quality extensions damaged them (Ms =

1 32 vs 38, $F(1, 205) = 62\ 24, p < 001$) Second, although lower-quality extensions improved perceived innovativeness, they did so significantly less than higher-quality extensions (Ms = 1 13 vs 46, $F(1, 205) = 28\ 55, p < 001$)

Mediation tests To test for mediation of the line-extension asymmetry in brand attitudes, we added perceived brand prestige, expertise, and innovativeness (differences from control) to the asymmetry models, with all three potential mediators correlated with brand attitudes (r(212)s = 65, 72, and 63, respectively, $ps < 001$) Neither perceived brand prestige nor expertise could have mediated the asymmetry (e g , with expertise controls, least-square-adjusted brand-attitude M_As = 1 03 and 69, asymmetry $F(1, 204) = 10\ 86$, $p = 001$), though perceived brand innovativeness could have Adding perceived innovativeness to the model produced a significant effect that reduced the asymmetric effects on brand attitude to nonsignificance ($F(1, 204) = 1\ 07$, $p = 30$) Lower-quality extensions damaged brand attitudes ($M_A = 79$) nearly as much as higher-quality extensions improved them ($M_A = 93$)

To highlight the nature of the underlying opponent processes, we added perceived innovativeness to an overall model that included control conditions and collapsed the model across higher- and lower-quality extensions to simplify Relative to control ($M_A = 4\ 59$), higher-quality extensions continued to improve brand attitudes ($M_A = 5\ 33, p <$ 001), but instead of lower-quality extensions having no effect on brand attitudes, as was the case originally (Figure 1), they reduced brand attitudes significantly ($M_A = 3\ 98, p <$ 001) This pattern suggests that lower-quality extensions originally produced negative quality-association effects on brand attitudes but that these effects were masked by countervailing positive effects on perceived brand innovativeness It seems that opponent processes produced null brand-attitude effects and the line-extension asymmetry, both of which disappear when controlling for the lower-quality extensions' positive effect on perceived brand innovativeness

Discussion

Study 1 finds a line-extension asymmetry in which higher-quality extensions improve brand attitudes and perceived brand prestige, expertise, and innovativeness more than lower-quality extensions damage them The finding that lower-quality extensions failed to damage brand attitudes or perceived brand expertise is telling given that offering two lower-quality extensions reduced average brand quality substantially The results support the best-of-brand processing hypothesis that higher-quality, but not lower-quality, extensions signal changes in brand capability in that higher-quality extensions improved perceived brand expertise whereas lower-quality extensions had no effect

Study 1 supports opponent processes as well Lower-quality line extensions reduced perceived brand prestige, consistent with negative quality-association effects (Janiszewski and Van Osselaer 2000), but increased perceived brand innovativeness, consistent with positive variety effects (Berger, Draganska, and Simonson 2007) Moreover, controlling for perceived brand innovativeness eliminated the line-extension asymmetry on brand attitudes in addition to the neutral effects of lower-quality extensions (making them negative instead) Thus, higher-quality line extensions improved brand perception and evaluation, whereas lower-quality extensions had both negative and positive effects

A scaling artifact may have contributed to the asymmetries Because the middle-quality brand offered quality just above average (e g , 5 of 7 quality stars), the highest-quality extension offered the scale's highest quality possible (e g , 7 of 7 stars), whereas the lowest-quality extension offered quality just below average (e g , 3 of 7 stars) Thus, greater scale extremeness may have produced stronger positive responses to the higher-quality extensions than negative responses to the lower-quality extensions Therefore, we conducted a large follow-up study to test this possibility, one that also tested whether the line-extension asymmetry generalizes to different product classes and real brands, and whether the asymmetry is blunted by brands that are more familiar or better liked

The follow-up study mimicked Study 1's general format but with (1) only one extension level down or up in quality while testing, (2) fictitious versus real brands of restaurants (Metro [fictitious] and Ruby Tuesday [real]) and beers (Metro [fictitious] and Foster's [real]), and (3) the potential moderating effects of a priori brand familiarity and brand liking Pretests indicated that the real brands were well known and perceived at middle quality In the experiment, 218 U S juniors and seniors imagined taking a job in a U S city far from their university We controlled scale extremeness by having the flagship offer a single version at 4 of 7 stars in the control conditions and adding a higher-quality extension at 6 stars or a lower-quality extension at 2 stars in experimental conditions Foster's Grog or Ruby Tuesday's Corner Diner at 2 stars or Foster's Select or Ruby Tuesday's Private Kitchen at 6 stars At the outset, participants used seven-point scales to indicate their familiarity with, and liking of, 14 brands across four product classes, which included the target brand

Regardless of brand, product class, brand familiarity, and brand liking, asymmetries again emerged on all four outcome dimensions (The asymmetry was smaller but still significant for real brands) Higher-quality extensions improved brand attitude and prestige as well as perceptions of brand expertise and innovativeness, whereas lower-quality extensions did not significantly alter any of these Unlike Study 1, lower-quality extensions did not reduce brand prestige or increase perceived brand innovativeness (details available from the authors)

The follow-up study's replication of Study 1's asymmetric line-extension effects indicates that Study 1's asymmetries were not the result of a scaling artifact Moreover, the results showed that the asymmetry generalizes to different product classes and to real brands with which consumers are familiar However, the finding that opposing negative prestige and positive innovativeness effects of lower-quality extensions did not emerge as in Study 1 implicates other potential processes One such process is best-of-brand processing, with its limited perceived relevance of lower-quality extensions, a process we tested more directly in Study 2

Study 2: Line-Extension Relevance

Across four product classes and both real and fictitious brands, Study 1 and its follow-up indicate that higher-quality line extensions improve brand perception and evaluation more than lower-quality extensions damage them. Study 2 extends these demonstrations with tests of perceived extension valence and relevance. Both opponent processes and best-of-brand processing predict that consumers will view higher-quality line extensions as positive but lower-quality extensions as more neutral. Best-of-brand processing further predicts that consumers will view lower-quality (but not higher-quality) extensions as largely irrelevant to brand evaluation. In addition to its implications for theory, tests of line-extension relevance are important for practitioners. If consumers consider lower-quality extensions as largely irrelevant to brand evaluation, such extensions may pose little threat of brand dilution, which in turn may increase managerial appeal. However, if opponent processes arise, managers may consider their negative effects too great a threat.

We also designed Study 2 to rule out two other potential sources of line-extension asymmetries. First, consumers have dual tendencies to treat brands as people (Aggarwal and McGill 2007; Fournier 1998) and to exhibit positivity biases toward people (for a review, see Sears 1983). Such tendencies suggest that brands with human images (e.g., fun, exciting, personable) exaggerate line-extension asymmetries. Therefore, Study 2 tests brands with austere versus personable images. Because these images fail to have an effect, the results suggest further generalizability of the asymmetry and indicate that brand personableness is not a contributor.

Second, Study 2 tests regulatory focus (Higgins et al. 2001), which previous research has found to moderate consumer sensitivity to some brand strategies (Wan, Hong, and Sternthal 2009; Yeo and Park 2006). Because a prevention focus exaggerates reactions to negative stimuli, consumers high in prevention focus may react especially negatively to lower-quality extensions and thus fail to exhibit the asymmetry (Shine, Park, and Wyer 2007). Nonetheless, Study 2 finds that neither promotion nor prevention foci moderate line-extension asymmetries or correlate with (1) the perceived negativity of lower-quality extensions or (2) the perceived relevance of line extensions to brand judgments. One contributing factor may be that in general, consumers see lower-quality extensions as neutral, not negative.

Pretest

Because prior studies' product classes and various brands produced similar line-extension asymmetries, Study 2 tested only restaurants. For an austere image, the name Restaurant XYZ was used (name described as a disguise for a conglomerate that owned the restaurant). The other brand needed to have an enriched, more human image while offering only middle quality to permit (1) lower-quality and higher-quality extensions equidistant from control and (2) comparisons with similar conditions in the other studies. We chose the restaurant T.G.I. Friday's, a large U.S. chain that has cultivated an image of a fun, exciting brand (e.g., red-and-white striped tablecloths, cobranding a line of entrees with Jack Daniel's whiskey). Fifty-seven university student participants rated the T.G.I. Friday's brand in addition to the two well-known brands from Study 1's follow-up study, Ruby Tuesday restaurants and Foster's beer, on Aaker's (1997) 42 items (1 = "not at all descriptive" to 5 = "very descriptive") that capture 15 personality traits across five general dimensions. The results indicated that 60% (9/15) of the traits were considered at least somewhat descriptive of T.G.I. Friday's, four of which were considered even more descriptive (higher than scale midpoints): spirited, successful, down-to-earth, and cheerful (Ms = 3.50, 3.57, 3.41, and 3.61). Moreover, T.G.I. Friday's was stronger than Ruby Tuesday on six traits (daring, spirited, up-to-date, reliable, intelligent, and successful) and weaker on none, and stronger than Foster's on seven traits (spirited, reliable, intelligent, successful, down-to-earth, cheerful, and charming) and weaker on only two (outdoorsy and tough). T.G.I. Friday's thus enjoys a somewhat human image (e.g., cheerful, spirited, down-to-earth) that is at least moderately rich and richer than the images of two other well-known middle-quality brands.

Method

Two hundred twenty juniors and seniors at a major U.S. university were randomly assigned to conditions defined by the between-subjects crossing of line-extension condition (middle quality alone or middle quality plus a higher- or lower-quality extension) and brand personableness (low [Restaurant XYZ], high [T.G.I. Fridays]). Participants imagined accepting a position in a city far from their university (Boston). They were told that after their first week in town, they encountered a food critic's ratings of six restaurants in the entertainment section of the *Boston Globe*'s Sunday newspaper. Participants were asked to examine the reviews carefully before turning the page. On the next page, participants rated the target brand on each of Study 1's four constructs using the same 12 items (comparable reliabilities). Participants in experimental conditions proceeded to one additional page on which they allocated 100 points across the flagship and line extension to reflect the relative weight given to each when evaluating brand liking, prestige, expertise, and innovativeness (four separate questions, one for one indicator of each construct). Participants also responded to 11 nine-point Likert items assessing promotion (standardized $\alpha = .62$) and prevention (standardized $\alpha = .78$) regulatory foci (Higgins et al. 2001). Finally, two additional nine-point Likert scales assessed extension valence: "If a brand introduces a higher-quality (lower-quality) version to its line, I see that as a good (bad) thing."

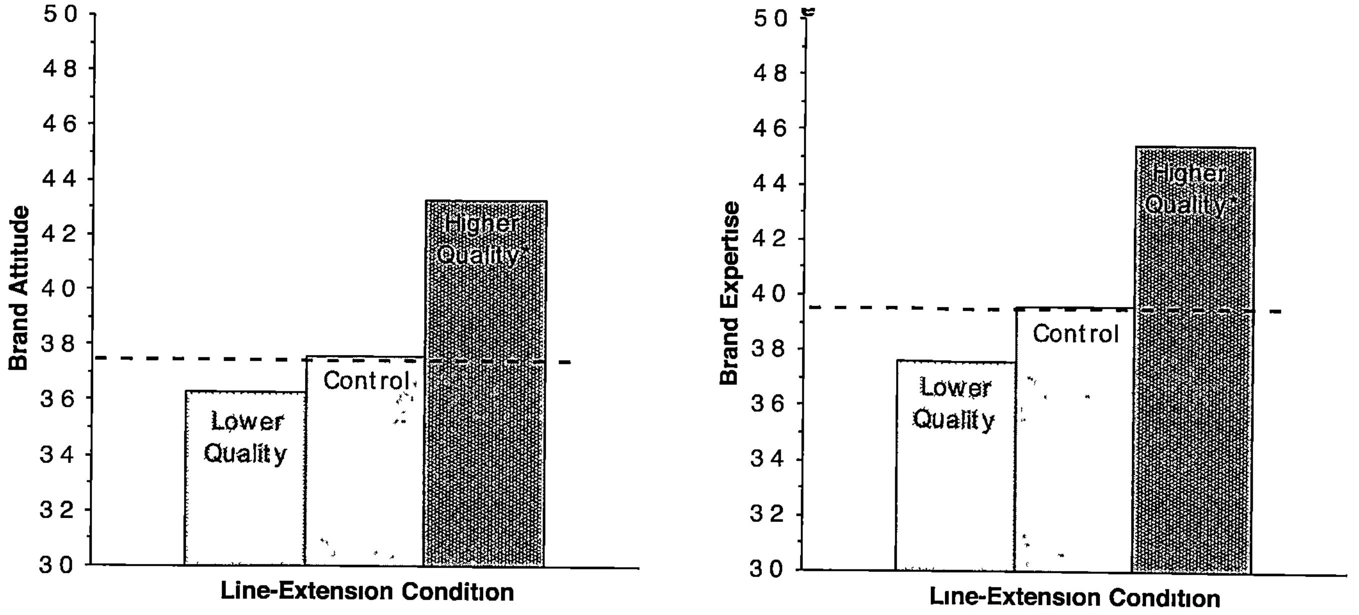
Results

Brand attitudes and perceptions. Line-extension × brand-personableness ANOVAs reveal asymmetric extension effects. Relative to control, higher-quality extensions improved brand assessments on all four dimensions (items marked with an asterisk in Figure 2), whereas lower-quality extensions affected none (Table 2 and Figure 2). For example, the line-extension effect on brand attitudes was significant ($F(2, 214) = 6.21$, $p = .002$), in which higher-quality

FIGURE 2
Study 2: Asymmetric Effects of Lower-Quality and Higher-Quality Extensions

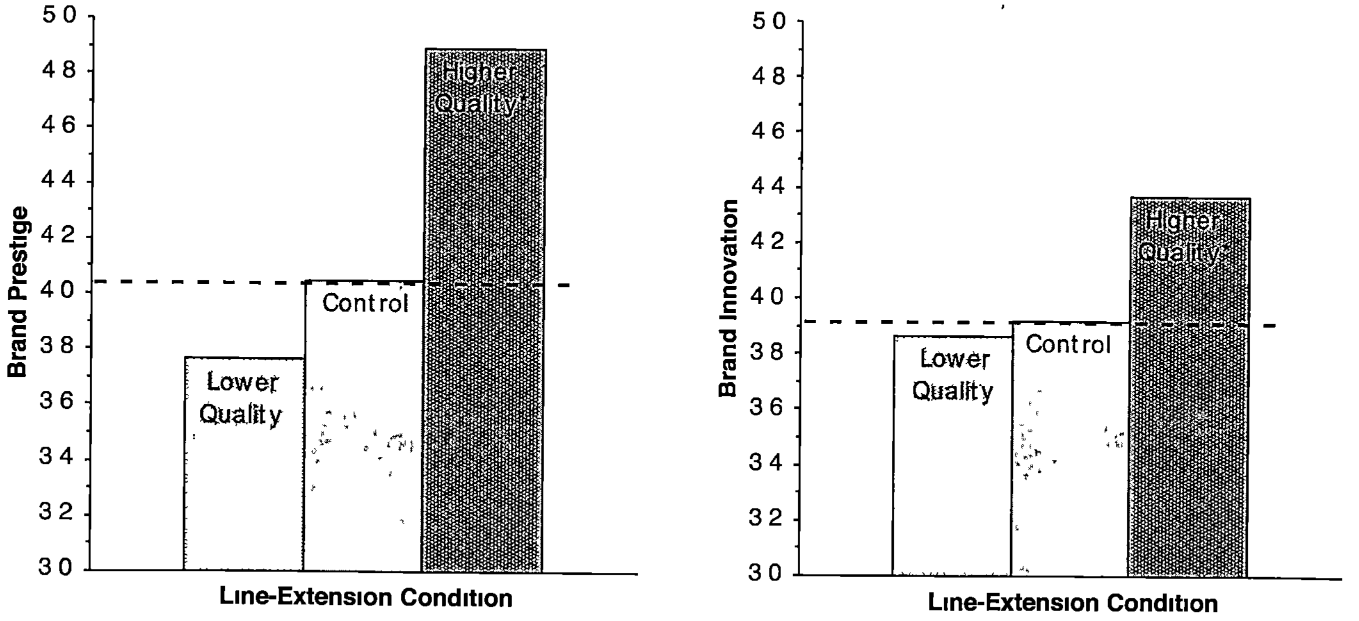
A: Brand Attidude

B· Brand Expertise



C: Brand Prestige

D. Brand Innovation



Notes Least-square-adjusted means plotted (raw means available in the text and Table 2) * = significant difference from control ($p <$ 003, Dunnett's tests)

extensions helped more than lower-quality extensions hurt (Ms = 56 and 14, F(1, 144) = 3 74, $p <$ 055) Unlike Study 1, but like its follow-up study, there was no direct evidence of opponent processes in that lower-quality extensions did not significantly improve or damage any dimension (though Study 3 suggests that opponent processes were at work, albeit at a more molecular level)

Neither brand personableness nor regulatory focus played a role in the four asymmetries None of the interactions of either variable (including promotion focus, prevention focus, and a difference score between the two) with line-extension quality approached statistical significance

Line-extension valence and weighting Consistent with opponent processes and best-of-brand processing, higher-quality extensions were considered positive and lower-quality extensions were considered neutral Compared with neutral scale midpoints and regardless of experimental condition, participants agreed that it is good for brands to offer higher-quality versions (M = 1 92, t (219) = 19 04, $p <$ 001) but

TABLE 2
Study 2 Brand Ratings

Dimension	Brand Image	Line-Extension Conditions: Lower Quality	Control	Higher Quality
Brand attitude	Austere	3 37 (38)	3 53 (36)	4 14 (37)
	Personable	3 88 (35)	4 00 (36)	4 52 (36)
Brand prestige	Austere	3 63 (38)	4 00 (36)	4 98 (37)
	Personable	3 91 (34)	4 08 (36)	4 80 (38)
Brand expertise	Austere	3 57 (38)	3 81 (36)	4 60 (36)
	Personable	3 95 (34)	4 12 (36)	4 51 (38)
Brand innovativeness	Austere	3 63 (38)	3 53 (36)	4 27 (37)
	Personable	4 12 (35)	4 31 (36)	4 47 (38)

Notes All ratings are on seven-point scales (n's in parentheses) Control consisted of a middle-quality brand to which experimental conditions added a lower-quality or a higher-quality extension

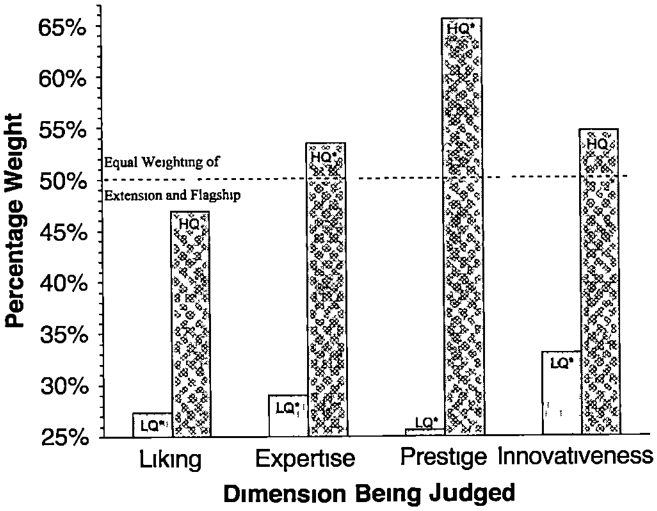
disagreed that it is bad for brands to offer lower-quality versions (M = – 47, t(217) = –3 41, p < 001)

Consistent with best-of-brand processing, line-extension × brand personableness ANOVAs reveal that participants weighted higher-quality extensions more than lower-quality extensions when judging brand liking, prestige, expertise, and innovativeness (Table 3 and Figure 3) Each pair of Figure 3's bars compares weights across the lower-quality and higher-quality extensions, which is a between-groups comparison (the unplotted flagship weight is always 100 minus the plotted extension weight) As Figure 3 illustrates, participants consistently weighted higher-quality extensions as much or more than flagship versions, and more than lower-quality extensions (e g , in brand liking, Ms = 46 9 and 27 4, F(1, 133) = 35 02, p < 001)

Mediation tests and causal model Perceived brand prestige, expertise, and innovativeness were correlated with brand attitude (r's(217–219) = 69, 78, and 67, ps < 001) and adding any of these to the brand-attitude model produced a significant effect that eliminated the line-extension asymmetry on brand attitude (e g , innovativeness, the weakest effect, reduced the asymmetry to F(1, 143) = 60, p = 44, M_As = 42 and 28) Thus, it seems that any or all three brand perceptions mediated the asymmetric line-extension effects on brand attitude

We also tested whether each extension weight (e g , when judging perceived brand innovativeness) might have mediated the asymmetry on each outcome (e g , perceived brand innovativeness) The first such test failed Extension weights when judging brand liking were uncorrelated with brand liking and thus could not account for the asymmetry in brand attitude

FIGURE 3
Study 2: Lower-Quality Extensions Are Less Relevant to Brand Evaluation and Perception Than Are Higher-Quality Extensions and Flagship Brands (Flagship Weight = 100 – Extension Weight)



* = weight differed significantly from 50%, which also meant that the participants weighted the line extension significantly more or less than the flagship

Notes LQ = conditions in which flagship brands also offered a lower-quality extension, and HQ = conditions in which flagship brands also offered a higher-quality extension The LQ and HQ weights were thus produced by different groups The flagship's weight was always 100 – the extension's weight 50% = equal weighting of the flagship and line extension

TABLE 3
Study 2 Weights on Flagship Versions and Line Extensions

Dimension	Austere Brand Image: Lower Quality	Austere Brand Image: Flagship	Austere Brand Image: Higher Quality	Personable Brand Image: Lower Quality	Personable Brand Image: Flagship	Personable Brand Image: Higher Quality
Brand liking	36 05 (38)	(100 – x)	60 54 (37)	18 00 (35)	(100 – x)	33 55 (38)
Brand prestige	27 50 (38)	(100 – x)	71 23 (37)	23 57 (35)	(100 – x)	59 61 (38)
Brand expertise	30 71 (38)	(100 – x)	64 86 (37)	27 14 (35)	(100 – x)	53 68 (38)
Brand innovativeness	34 47 (38)	(100 – x)	59 86 (37)	32 00 (35)	(100 – x)	49 47 (38)

Notes n's in parentheses We varied lower- and higher-quality extensions between subjects, where weights on flagship versions were 100 minus the weight an adjacent extension (x)

However, extension weights accounted for the line-extension asymmetries in perceived brand expertise, prestige, and innovativeness Extension weights were correlated significantly with perceived prestige (r(146) = 31, $p <$ 001) and expertise (r(145) = 29, $p <$ 001), respectively, and marginally with innovativeness (r(146) = 15, $p =$ 065) Moreover, adding each weight to its respective model produced a significant effect that eliminated the line-extension asymmetry in perceived brand prestige (F(1, 142) = 69, $p =$ 41, M_As = 66 and 46), expertise (F(1, 142) = 22, $p =$ 64, M_As = 45 and 35), and innovativeness (F(1, 143) = 2 42, $p =$ 123, M_As = 42 and 08)

Figure 4's path analysis retests the findings and their process implications The model derives from the tests just reported, those in which statistical controls for prospective mediators eliminated otherwise statistically significant experimental effects We estimated this model with manifest variables because of the limited number of data points per construct (EQS estimation, Bentler 1989) The model illustrates the finding that differential extension relevance constitutes a root cause of the line-extension asymmetries Differential extension relevance produces asymmetric extension effects on perceived expertise, prestige, and innovativeness, and these asymmetries produce an asymmetric extension effect on overall brand attitude

Discussion

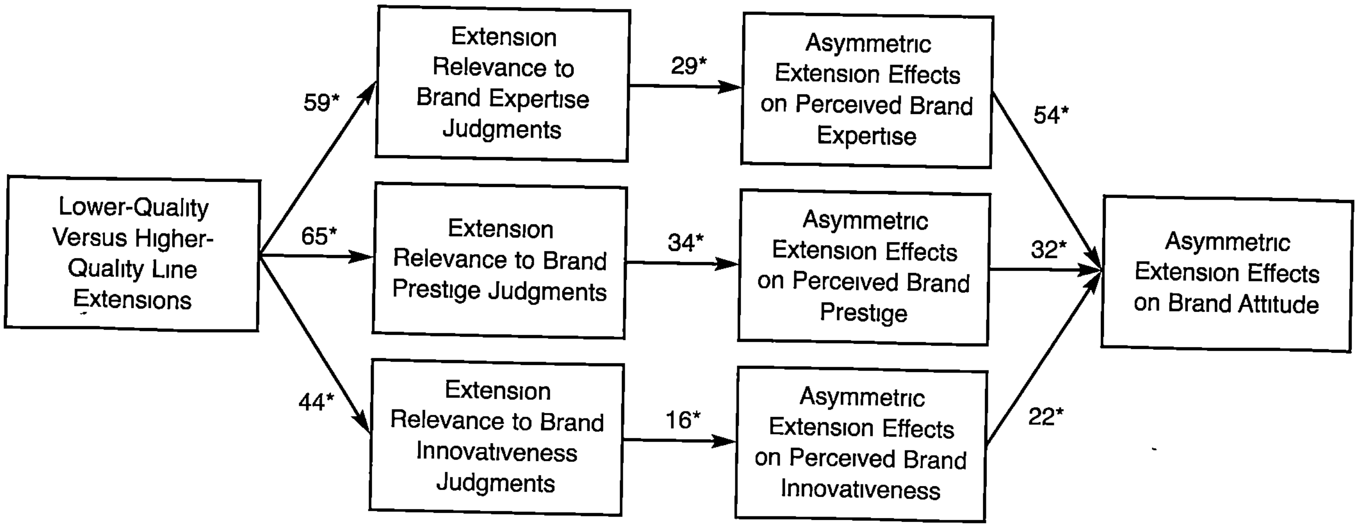
Study 2 demonstrates the robustness of line-extension asymmetries while clarifying underlying processes The asymmetries do not seem to arise as a result of brand personableness or regulatory focus One explanation for the lack of a regulatory-focus effect, especially the failure of a prevention focus to exaggerate responses to lower-quality, and ostensibly negative, line extensions, is that in general, participants did not consider lower-quality extensions negative To assess this interpretation, we examine correlations of prevention focus with perceived lower-quality-extension negativity and weights placed on lower-quality extensions Prevention focus was uncorrelated with the perceived negativity of lower-quality extensions (r(208) = 02, $p =$ 74) and uncorrelated with weights on lower-quality extensions (experimental conditions only) when judging brand liking, expertise, prestige, and innovativeness (r(72)s = 10, – 008, 06, and 03, respectively, $ps >$ 38) To illustrate, even participants with the strongest prevention focus (scores > 7 4/9 0, top 11%) perceived lower-quality extensions as neutral (M = 4 42, < negativity scale's midpoint of 5) and weighted higher-quality extensions more than lower-quality extensions (e g , when judging brand liking, Ms = 51 4 vs 31 8, F(19) = 4 16, $p =$ 056) Nonetheless, researchers interested in potential regulatory focus effects may want to manipulate regulatory focus to produce more extreme variations

The results support best-of-brand processing in three ways First, and also consistent with opponent processes, participants considered the addition of a higher-quality version to a product line a good thing but considered the addition of a lower-quality version at worst neutral Second, participants considered higher-quality extensions far more relevant to brand evaluation than lower-quality extensions Third, perceived extension relevance accounted for the line-extension asymmetries in perceived brand expertise, prestige, and innovativeness, asymmetries that accounted for the line-extension asymmetry in brand attitudes The limited relevance of lower-quality line extensions may allay managerial concerns about such extensions, though Study 3 indicates that both best-of-brand and opponent processes arise but vary across consumers

Although Study 1's follow-up study and Study 2 do not evidence opposing prestige and innovativeness effects of lower-quality extensions, opponent processes may still have

FIGURE 4

Study 2: Differential Extension Relevance as a Root Cause of Asymmetric Line-Extension Effects


Lower-Quality Versus Higher-Quality Line Extensions
59*
65*
44*
Extension Relevance to Brand Expertise Judgments
Extension Relevance to Brand Prestige Judgments
Extension Relevance to Brand Innovativeness Judgments
29*
34*
16*
Asymmetric Extension Effects on Perceived Brand Expertise
Asymmetric Extension Effects on Perceived Brand Prestige
Asymmetric Extension Effects on Perceived Brand Innovativeness
54*
32*
22*
Asymmetric Extension Effects on Brand Attitude

* = significant path coefficient ($p <$ 05)

Notes The phrase Asymmetric Extension Effects refers to differences from no-extension control conditions that are larger in higher-quality than lower-quality extension conditions been at work, albeit at the more molecular level of these specific dimensions. For example, negative quality-association and positive variety effects of lower-quality extensions may have offset each other's effect on perceived brand innovativeness, which Study 1's data suggest is possible. Whereas Study 1's lower-quality extensions increased perceived innovativeness, higher-quality extensions did so far more. One explanation is that lower-quality extensions produced a positive variety effect on perceived brand innovativeness that was partially offset by a negative quality-association effect. Study 3 tests the possibility of opponent processes operating on such specific brand perceptions by more directly measuring quality-association and variety effects.

Study 3: Prestige, Processes, and Asymmetry Directions

Although the prior studies demonstrate a robust line-extension asymmetry in which higher-quality extensions help but lower-quality extensions do little damage, the numerous brands tested were often nonsymbolic brands (e.g., fictitious middle-quality pasta sauces). It is possible that more symbolic (e.g., prestigious) brands would be more vulnerable to any deleterious effects of lower-quality extensions. Thus, Study 3 extends prior demonstrations to tests of two brands that are of at least moderate prestige and expressiveness of consumer personalities within the United States: Heineken beer and H&M clothing stores. If brand prestige and symbolism are necessary for lower-quality line extensions to damage brand evaluation as much as higher-quality extensions help, the line-extension asymmetry indicated thus far should disappear in Study 3. The results actually reveal some negative effects of lower-quality extensions, though the standard asymmetry remains prevalent.

Study 3 explores line-extension asymmetries in greater depth by enlisting a within-subjects test of underlying processes that directly assesses opponent processes and best-of-brand processing. Manipulating extension quality within subjects tests effects at the level of the individual person and indicates that underlying processes vary across consumers, as do asymmetries, the latter of which include occasional reverse asymmetries in which negative responses to lower-quality extensions are larger than positive responses to higher-quality extensions.

Participants responded first to lower- and higher-quality extensions and then to process measures that directly tested quality-association effects, variety effects, their potential opposition, and best-of-brand processing by reporting whether each extension had a positive, neutral, or negative quality-association effect and variety effect on each brand perception dimension. The most diagnostic test of opponent processes and best-of-brand processing is that of lower-quality-extension effects on perceived brand expertise. Opponent processes predict a negative quality-association effect but a positive variety effect. However, because best-of-brand processing contends that lower-quality extensions are less relevant than higher-quality extensions, it predicts, in the extreme, complete irrelevance of lower-quality extensions and thus a neutral quality-association effect and a neutral variety effect.

Method

Brand pretest. To address symbolic brands, we sought brands that were (1) at least moderately prestigious and expressive of consumer personalities but (2) not so high in quality that they threatened ceiling effects on the influence of higher-quality extensions. Thirty-one undergraduate students at a large U.S. university rated Heineken beer and H&M clothing stores on Bhat and Reddy's (1998) 11 brand prestige items (seven-point scales, e.g., prestigious, distinctive, sophisticated, standardized $\alpha = .81$) and 6 personality-expression items (seven-point scales, e.g., brand says something about the kind of person you are, brand user stands out in a crowd, brand is symbolic, standardized $\alpha = .76$). Participants rated Heineken beyond moderately prestigious, the scale's midpoint of 4.0 ($M = 4.49$, $t(30) = 3.97$, $p < .001$), and beyond moderately expressive of a consumer's personality ($M = 5.14$, $t(30) = 8.89$, $p < .001$). Participants rated H&M as both moderately prestigious ($M = 4.08$, $t(30) = .45$, not significant [n.s.]) and moderately expressive ($M = 4.02$, $t(30) = .19$, n.s.).

Participants, design, and procedure. Eighty-four undergraduate students at a major U.S. university were randomly assigned to one of two product categories, in which target brand varied between subjects: a new category to this study, clothing stores (H&M), and an old one, beer (Heineken). Each respondent imagined two future scenarios which we varied within subjects. In one scenario, the target brand (said to have been rated at 4 of 7 quality stars by an independent research firm) had offered a lower-quality extension (2 stars) for the past few years, and in the other scenario, it had offered a higher-quality extension (6 quality stars) for the past few years: H&M Bazaar or Heineken Grog at lower quality and H&M Parisienne or Heineken Select at higher quality. For each scenario, respondents indicated how much they thought the line extension would alter their opinion of the brand on a −3 ("lower my opinion significantly") to 0 ("has no effect on my opinion") to +3 ("raise my opinion significantly") scale. To mitigate carryover effects in general and consistency biases in particular, evaluation of the second scenario was prefaced by a statement that people sometimes respond to the two scenarios comparably and sometimes differently, whether responses are similar or different does not matter, and all that matters is being honest. Despite these efforts, a conservative measure of consistency biases revealed their existence (see the "Results" subsection), which suggests that such biases sometimes went undetected and blunted asymmetries.

Process measures tested quality-association and variety effects directly. Participants read a short statement defining a potential quality effect ("the effect of associating the brand with either higher quality or lower quality") and a potential variety effect ("the effect of offering greater variety (more options)") and then indicated if any such effects of each extension on their brand perceptions were negative (−1), neutral (0), or positive (+1). We tested effects on perceived brand expertise, prestige, innovativeness, and sensitivity to diverse consumer tastes and budgets. (We added the latter on the basis of a small qualitative assessment, which is available on request.)

Results

The line-extension asymmetry. Of the 24 symmetric participants, 16 were dropped because they indicated their responses to the two extensions were equidistant from neutral because they wanted to seem consistent (consistency biases), leaving 68 usable responses. On the opinion change question (–3 to +3), higher-quality extensions produced significantly positive responses ($M = 1.25$, $t(67) = 9.06$, $p < .001$) while lower-quality extensions produced significantly negative responses ($M = -.85$, $t(67) = -6.19$, $p < .001$, Table 4).

We tested potential asymmetries in line-extension effects in two ways. First, we assessed line-extension asymmetries at the individual level, at which 41 respondents (60.3%) exhibited the standard asymmetry, 19 (27.9%) exhibited the reverse asymmetry and 8 (11.8%) exhibited symmetry. Thus, twice as many respondents exhibited the standard asymmetry as the reverse asymmetry ($\chi^2 = 8.07$, $p = .004$). In the standard asymmetry group, responses to higher-quality extensions ($M = 1.80$) were more positive than responses to lower-quality extensions were negative ($M = -.37$, $F(1, 39) = 142.57$, $p < .001$). In addition, in the reverse-asymmetry group, responses to lower-quality extensions ($M = -1.89$) were more negative than responses to higher-quality extensions were positive ($M = .21$, $F(1, 17) = 53.18$, $p < .001$).

We also tested the asymmetry at the aggregate level, in which, consistent with prior studies, the only effect that approached statistical significance ($F(1, 66) = 3.47$, $p = .067$) was line-extension quality, the extension-quality × brand interaction was not significant ($F(1, 66) = 0.54$, $p = .46$). Participants tended to respond more favorably to higher-quality extensions ($M = 1.25$) than unfavorably to lower-quality extensions ($M = .85$). The finding that this asymmetry is weaker than the asymmetries in the prior studies may reflect an effect of the symbolic brands tested but may also reflect methodological features (see the "Discussion" subsection).

Process measures. To assess the existence of opponent processes and further test best-of-brand processing, we turn to direct assessments of quality-association and variety effects. We focus on the standard asymmetry group because they exhibit the typical, more prevalent asymmetry and because the symmetry and reverse-asymmetry groups are quite small. Whereas higher-quality extensions produced eight uniformly positive quality-association and variety effects across perceived brand expertise, prestige, innovativeness, and sensitivity to diverse consumer tastes and budgets (see Figure 5), lower-quality extensions produced heterogeneous effects: three positive effects and a fourth close to significance, two negative effects, and two neutral effects. Opponent processes are implicated within and across perceived brand expertise, prestige, and innovativeness, though in each dimension, either the quality-association or variety effect is significant and the other is not. However, these aggregate-level data risk masking opponent processes at the individual level.

At the individual level, we focus on opponent processes and best-of-brand processing in response to lower-quality extensions. To simplify and be conservative, we ignore opponent processes across dimensions. Opponent processes within a dimension exist when a lower-quality extension exerts a negative quality-association effect but a positive variety effect on that dimension (e.g., perceived brand prestige). In contrast, best-of-brand processing is operationalized as (1) a lower-quality extension exerting a neutral quality-association effect and a neutral variety effect on a given dimension (extension irrelevance) and (2) the higher-quality extension exerting a positive effect (positive relevance). The best-of-brand criterion of complete lower-quality-extension irrelevance is conservative and doubtless underestimates the prevalence of best-of-brand processing by excluding people for whom the lower-quality extension is not entirely irrelevant but is merely less relevant than the higher-quality extension (for measures more sensitive to perceived brand relevance, see Study 2).

Figure 6 summarizes two key findings illustrating the prevalence of opponent processes and best-of-brand processing. First, opponent processes at the level of specific brand perceptions are common. Fully 51.2% of participants reported opponent processes on at least one of the four dimensions (perceived brand expertise, prestige, innovativeness, or sensitivity to diverse consumer tastes and budgets). Second, and despite the use of rather conservative criteria, best-of-brand processing was also common, arising in 39.0% of participants on at least one dimension. Combined, 78.0% of participants exhibited either opponent processes or best-of-brand processing at least once. Furthermore, across Figure 5's four dimensions, 39.0% of participants exhibited opponent processes at least once but not best-of-brand processing, and 26.8% exhibited best-of-brand processing at least once but not opponent processes. Therefore, we conclude that the standard asymmetry is associated with multiple, distinct processes.

Discussion

Because Study 3's aggregate-level (but not individual-level) asymmetry was weaker than the asymmetries the prior studies have found, it may be that lower-quality extensions had larger negative effects as a result of Study 3's use of more prestigious brands. However, enlisting a within-subject procedure to improve process tests risked methodological artifacts likely to have blunted asymmetries as well. Specifically, the procedure introduced a consistency bias that was evidenced on a rather conservative measure that reflected bias only when (1) it was strong enough to produce perfectly symmetrical responses to lower- and higher-quality extensions and (2) participants were honest enough to admit it. Thus, consistency biases probably went undetected elsewhere in the data where they deflated asymmetries.[1]

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[1] Allowing participants to see both extension directions may also have produced a demand effect that artificially inflated reverse asymmetries. Participants in previous studies sometimes said during debriefings that they expected the asymmetry to go in the opposite direction because they believed negatives to be more impactful than positives. Therefore, one possibility is that some participants responded with what they thought should happen across situations rather than how they themselves would respond in each situation.

TABLE 4
Study 3 Ratings

		Overall				Standard Asymmetry				Reverse Asymmetr		
		HQ		LQ		HQ		LQ		HQ		LQ
Opinion Change		1 25*	(68)	– 85	(68)	1 80*	(41)	– 37	(41)	21$^{\text{n s}}$*(19)		–1 89
Expertise												
	Quality effect	71	(68)	– 49	(68)	78	(41)	– 41	(41)	42	(19)	– 74
	Variety effect	66	(68)	21**	(68)	71	(41)	20$^{\text{m}}$	(41)	47	(19)	00$^{\text{n s}}$
Prestige												
	Quality effect	74	(68)	– 61	(67)	78	(41)	– 56	(41)	58	(19)	– 83
	Variety effect	65	(68)	– 07$^{\text{n s}}$**	(68)	71	(41)	10$^{\text{n s}}$	(41)	42	(19)	– 37$^{\text{m}}$
Innovativeness												
	Quality effect	50	(68)	– 06$^{\text{n s}}$	(68)	54	(41)	– 02$^{\text{n s}}$	(41)	26$^{\text{m}}$	(19)	– 32$^{\text{m}}$
	Variety effect	55	(67)	33**	(67)	57	(40)	46	(41)	37	(19)	– 05$^{\text{n s}}$
Sensitivity to Diverse Consumer Tastes												
	Quality effect	37	(68)	40	(68)	49	(41)	46	(41)	– 05$^{\text{n s}}$	(19)	11$^{\text{n s}}$
	Variety effect	54**	(68)	54**	(68)	61	(41)	59	(41)	32$^{\text{m}}$	(19)	37

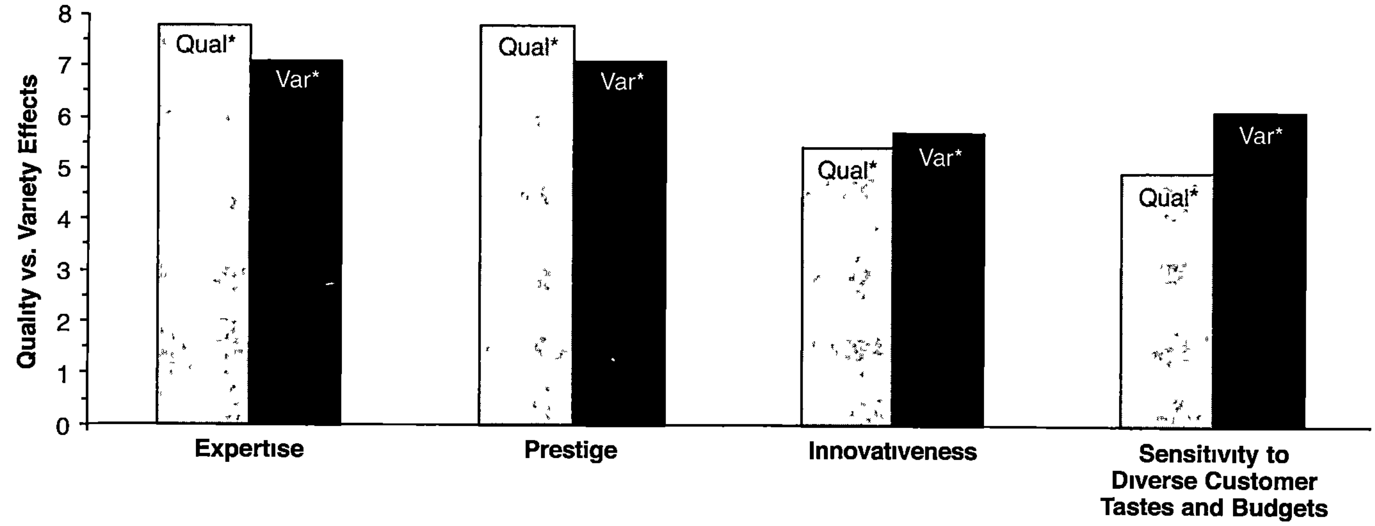
*Asymmetry in magnitude of positive higher-quality-extension and negative lower-quality-extension effects at $p =$ 067 overall and $p <$ 05 elsewhere
tastes by comparing the positive effects of both extensions

**Significantly different quality-association and variety effects ($p <$ 05, compare vertically)

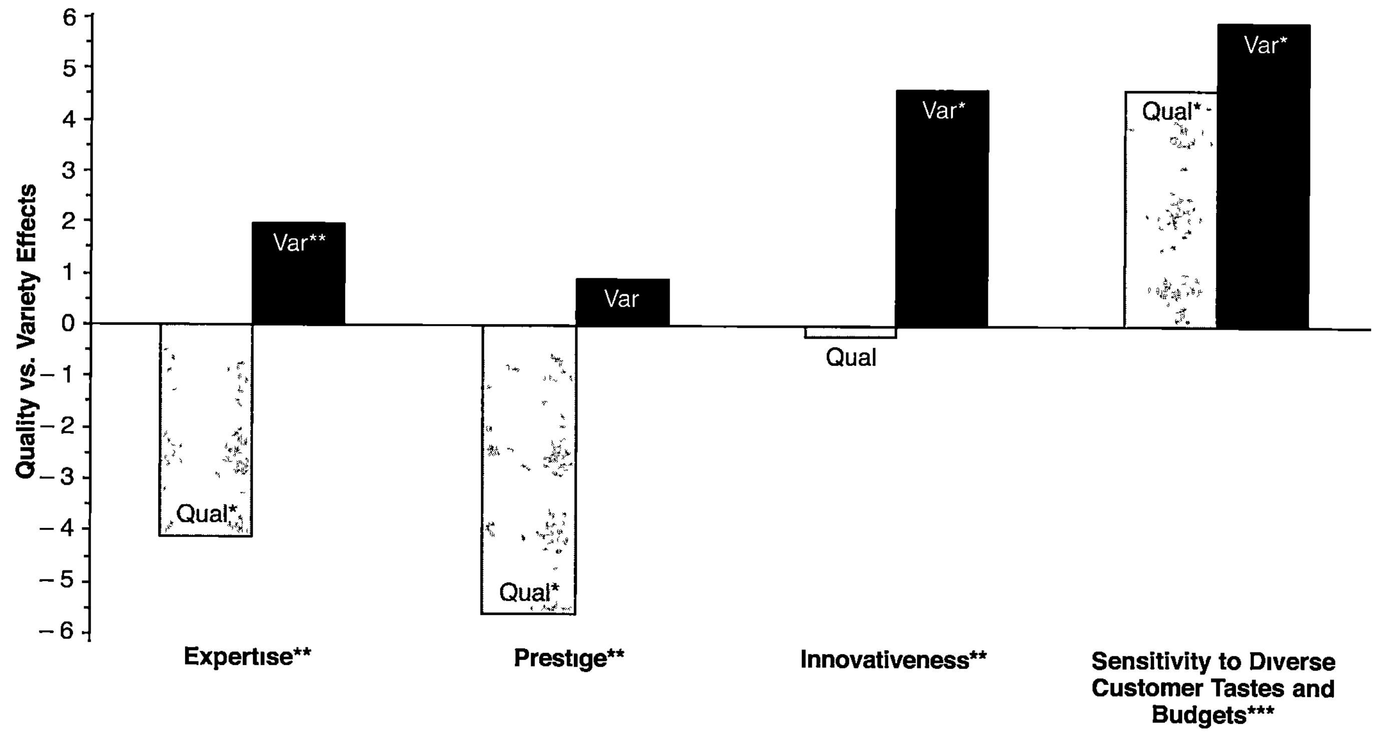
Notes HQ = higher-quality line extension, and LQ = lower-quality line extension Cell sizes are in parentheses All means differ significantly from 0 ($p <$
script n s (nonsignificant) or m ($p <$ 10)

FIGURE 5
Study 3: Only Lower-Quality Line Extensions Produce Opposing Quality-Association and Variety Effects Within the Standard Asymmetry Conditions

A. Higher-Quality Line Extensions—Uniform Quality and Variety Effects



B Lower-Quality Line Extensions—Discrepant Quality and Variety Effects

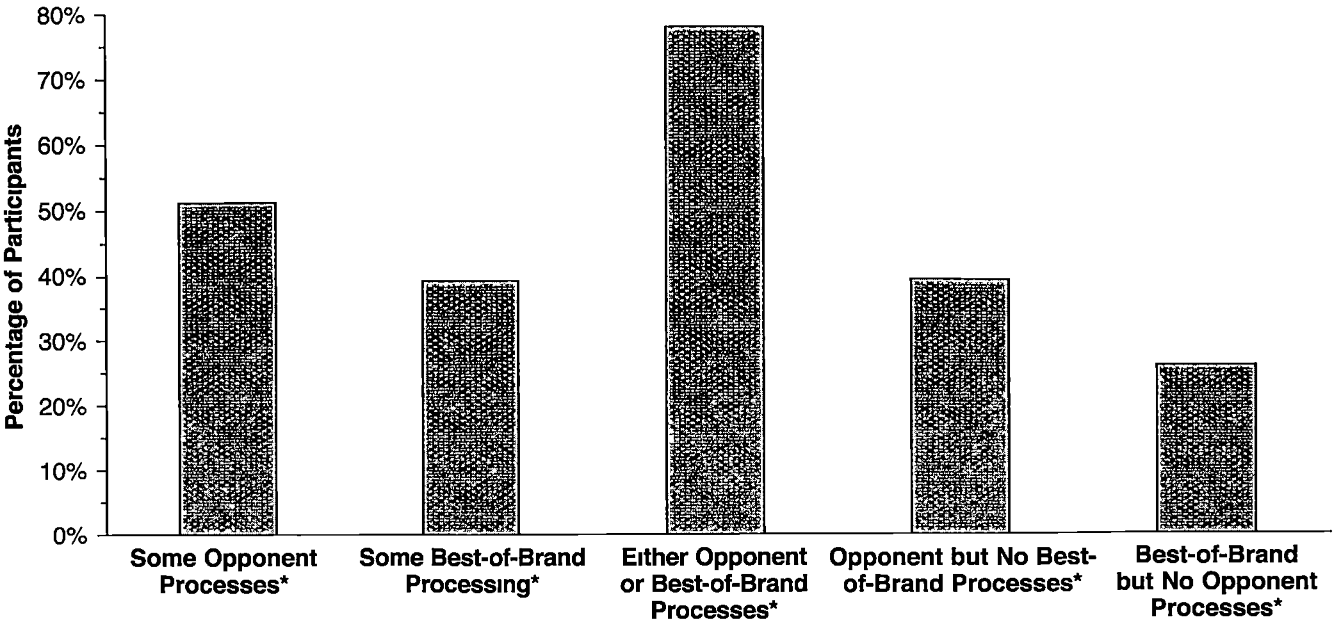


Notes: * associated with Qual or Var = mean difference from 0 is statistically significant (p < .05). **associated with a dimension (e.g., Expertise) = difference between the quality and variety effects on that dimension is statistically significant (p < .05). *** = the effect approaches statistical significance at p < .09.

Even if brand prestige reduced the standard asymmetry, it failed to eliminate the asymmetry altogether, one that emerged on a cruder single-item measure of brand evaluation and despite asymmetry-deflating consistency biases. Thus, Study 3 demonstrates the robustness of the line-extension asymmetry as well as its variance across consumers in both underlying processes and direction. Opponent processes are indicated at both the aggregate and individual levels, where lower-quality extensions often mix negative quality-association effects with positive variety effects. Process tests of quality-association and variety effects reveal that opponent processes can arise at the level of specific brand perceptions such as those of brand expertise and prestige. The implication is that whereas only

FIGURE 6

Study 3: The Processes Involved in the Standard Line-Extension Asymmetry Vary Across Participants



*Statistically significant segment sizes (binomial z's > 16 62, $p <$ 001)

Study 1 of the between-subjects tests indicates opposing prestige and innovativeness effects of lower-quality extensions, opponent processes may still have been at work in Study 1's follow-up study and Study 2, albeit at the level of the more specific brand perceptions themselves (e g , perceived brand innovativeness) Study 3 further shows that opponent-process and best-of-brand consumer segments can exist and yet exhibit the same line-extension asymmetry Thus, the asymmetry is not a unitary phenomenon but rather involves multiple processes that sometimes work in concert, sometimes in opposition, and sometimes vary across consumers

General Discussion

This study reports a robust line-extension asymmetry in which higher-quality extensions improve overall brand perception and evaluation more than lower-quality extensions damage them, the latter sometimes having no effect The asymmetry is consistent across various evaluative dimensions, product classes, real and fictitious brands, a priori brand liking and familiarity, brands with austere and personable images, brands of low to moderate prestige, and consumer regulatory focus The results have various implications for theory and practice

Implications for Theory

Process tests paint a nuanced picture of how consumers integrate vertical line extensions into existing brand schema Whereas higher-quality extensions typically produce positive effects, lower-quality extensions invoke at least two primary processes that produce multiple and sometimes conflicting effects (Figure 5) In best-of-brand processing, lower-quality extensions essentially produce no effect Consumers consider them neutral, not negative, and largely ignore them in brand evaluation But in opponent processes, lower-quality extensions produce both negative quality-association effects and offsetting positive variety effects Results reported elsewhere with horizontal line extensions (Berger, Draganska, and Simonson 2007) and here with vertical line extensions indicate that increasing the number of product versions in a line can improve evaluations on various dimensions, including perceived brand innovativeness, expertise, sensitivity to diverse consumer tastes and budgets, success, and brand energy and dynamism (Mizik and Jacobson 2008) Critically, however, such processes vary within and across consumers One consumer can exhibit best-of-brand processing on one dimension but opponent processes on another, whereas another consumer consistently exhibits a single process (Figure 6)

Nonetheless, more theory is needed to help identify the asymmetry's underlying dynamics For example, whereas the current study indicates that consumers sometimes ignore lower-quality extensions because such extensions signal no change in brand capability (Figures 1 and 2), at least one additional factor may play a role Consumers may dismiss small negatives as inconsequential in an attempt to be positive or optimistic (Sears 1983) To illustrate, although losses (e g , –$50) generally carry more absolute psychological value than gains (e g , +$50), small payoffs (e g , $ 50) reverse such loss aversion because people tend to dismiss small losses (Harinck et al 2007) Any such hedonic editing would be consistent with Study 2's perceived positivity of higher-quality extensions and perceived neutrality of lower-quality extensions

Implications for Marketing Practice

Asymmetric consumer responses to lower- and higher-quality line extensions suggest that managers otherwise skeptical of extending brands to lower quality reconsider Combined with the marketing efficiency associated with brand extensions (e g , Smith and Park 1992), the asymmetry supports leveraging brands across quality tiers

However, this does not mean that lower-quality extensions are harmless Studies 1 and 2 indicate directional (nonsignificant) negative lower-quality-extension effects, and Study 3 finds occasional reverse asymmetries Moreover, even if a negative effect is small (and nonsignificant) on ratings measures such as those reported here, choice can amplify the effect if consumers are otherwise torn between two competitors In "tipping point" fashion, a trivial factor can have a significant impact on decisions (e g , McCarthy, Heath, and Milberg 2001)

Managers should also consider potential negative effects on evaluations of their individual products, not just on the overall brand evaluations studied here For example, adding the luxury car Phaeton to the Volkswagen line probably helped Volkswagen's otherwise average image in the United States, but tying the Phaeton to Volkswagen probably hurt the Phaeton's hoped-for prestige image and thus its competitiveness (The Phaeton failed in the U S market, though by all accounts it is a high-quality car) Toyota's contrasting success with its separate luxury brand, Lexus, suggests that managers should balance effects on their overarching brand with those on their individual products and, in some cases, pursue multibranding rather than line extensions Moreover, when making such determinations, managers should keep in mind that evaluations of individual products are more sensitive to overall brands than evaluations of overall brands are sensitive to individual products (John, Loken, and Joiner 1998)

If managers choose to extend to different quality levels, they have at least four options for insulating against image dilution First, managers can enlist prudent branding strategies that include, in the extreme, the multibranding just noted A more moderate option is that of subbranding, a middle ground between multibranding and line extensions in which a new brand is introduced but said to be produced by the parent brand (e g , "Dockers by Levi's") Subbranding to new product categories (brand extensions) reduces negative image backlash to the parent brand in its home category (Janiszewski and Van Osselaer 2000, Milberg, Park, and McCarthy 1991, Monga and John 2010, Sood and Keller 2007) Image insulation is also reported when subbrands are applied within existing categories (Kirmani, Sood, and Bridges 1999)

Second, managers can moderate image dilution through distribution For example, Charmin's lower-quality extension, Charmin Basic, is often distributed through discount channels such that regular Charmin customers rarely see Charmin Basic and even more rarely see it on a shelf next to Charmin, thereby mitigating image dilution for these consumers

Third, managers can reduce the negative impact of lower-quality extensions by how they produce the products For example, BMW's lower-quality 1-Series enlists BMW's typical numerical indicator in its name, and the cars themselves incorporate BMW's typical status indicators (e g , high-quality/high-gloss paint, judicious use of chrome, shapes and styles similar to BMW's more prestigious lines), all of which serve to support the brand's prestige image

Fourth, because Study 3 suggests that expanding a product line can signal sensitivity to diverse consumer preferences, managers may want to emphasize this in promotions by noting that lower-quality versions are being added to give consumers affordable options high on value Such spins may temper any negative effects of lower-quality extensions and exaggerate the positive effects of higher-quality extensions For example, the tag line on the lower-quality Bounty Basic paper towels reads, "Practical Not Pricey "

Limitations and Suggested Further Research

Despite the standard asymmetry's robustness and the direct evidence of its underlying processes, the asymmetry's occasional reversals require further theory and research Researchers do not yet know which combinations of consumers, brands, product classes, and outcomes (e g , brand perception, evaluation, choice) will produce deviations from the standard asymmetry and/or materially negative responses to lower-quality extensions The richness of the underlying processes as well as potential idiosyncrasies therein suggests that further research should develop theories and classifications of various situational components to help predict when and where different processes and asymmetries will arise As examples, extension extremity and number may play a role Whereas the current study tested two-point quality differences on seven-point scales and often assessed only one extension at a time, lower quality levels and/or more extensions at those levels may produce larger effects (e g , Study 1's innovativeness data) However, if more severe quality differences are considered, it is important to note that stark contrasts can produce a form of subtyping that reduces carryover to overall brand evaluation and thus mitigates brand dilution (Gurhan-Canli and Maheshwaran 1998)

On a related note, practitioners and academic researchers alike may want to consider the impact of the flagship brand's status and its location in price/quality space Although Study 3 tested symbolic brands, these brands were still of moderate quality and prestige (or slightly higher), such that further research is needed to test brands positioned more extremely

Moreover, imagine that a brand offered quality versions at 2, 4, and 6 quality stars, in which the flagship could be at 4 stars, as in the current study, or at 2 or 6 stars A lower-quality flagship at 2 stars may create such a low-quality image that higher-quality extensions fail to elevate brand perception and evaluation as much as occurred for the middle-quality flagship brands in the current study This same reasoning applied to higher-quality luxury brands may help explain why luxury brands commonly offer lower-quality versions (e g , BMW's 1-Series, Armani's Armani Exchange, Drum Workshop's Pacific line) When Marc Jacobs offers Marc at lower-quality levels and prices, damage to brand image may be tempered not only by lower-quality products failing to signal an erosion in brand capability but also by the flagship brand being the highest-quality version in the line Nonetheless, further research on luxury brands is needed, partly because regular luxury-brand consumers may not like seeing their brands being consumed by the masses (Berger and Heath 2007, Kirmani, Sood, and Bridges 1999), and partly because such consumers consist of diverse segments whose different values may moderate how they respond to luxury brands offering lower-quality products (Han, Nunes, and Drèze 2010)

Finally, future researchers should consider other potential moderators such as consumer–brand relationships (Fournier 1998) and brand ownership (Kirmani, Sood, and Bridges 1999) Consumers whose brands help identify who they are may respond (1) more positively to higher-quality extensions if they see themselves as status shoppers, (2) less positively to higher-quality extensions if they see themselves as no-nonsense value shoppers, and (3) the opposite of these in response to lower-quality extensions Such effects seem especially likely in durables markets, in which previous research has found brand ownership to moderate extension effects (Kirmani, Sood, and Bridges 1999) Thus, further research is needed to help researchers understand when and why line-extension asymmetries arise in one direction or another and how managers can moderate them

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Deepa Chandrasekaran & Gerard J. Tellis

Getting a Grip on the Saddle: Chasms or Cycles?

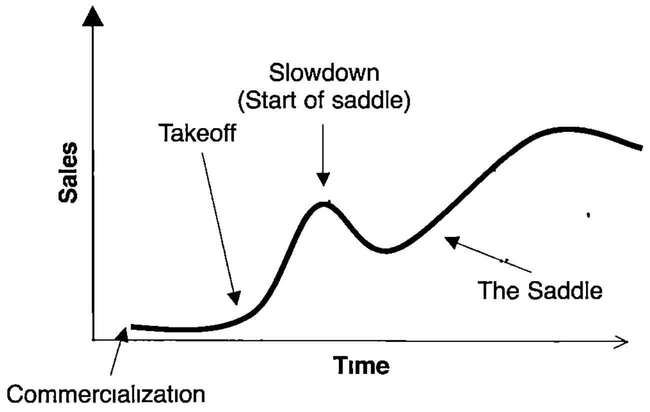
The "saddle" is a sudden, sustained, and deep drop in sales of a new product, after a period of rapid growth following takeoff, followed by a gradual recovery to the former peak The authors test for the generalizability of the saddle across products and countries and for three rival explanations chasms in adopter segments, business cycles, and technological cycles They model both boundary points of the saddle—start of the sales drop and recovery to the initial peak—using split-population models Empirical analysis of historical sales data from ten products across 19 countries shows that the saddle is fairly pervasive The onset of the saddle occurs in 148 product–country combinations On average, the saddle occurs nine years after takeoff, at a mean penetration of 30%, and it lasts for eight years with a 29% drop in sales at its depth The results support explanations of chasms and technological cycles for information/entertainment products and business cycles and technological cycles for kitchen/laundry products The authors conclude with a discussion of the findings, contributions, and implications

Keywords new product diffusion, international marketing, chasm, business cycles, hazard models

A "saddle" is a phenomenon characterized by a sudden, sustained, and deep drop in sales of a new product, after a period of rapid growth following takeoff, followed by a gradual recovery to the former peak (Figures 1 and 2) Recent studies have empirically documented this phenomenon of a trough in sales For example, Goldenberg, Libai, and Muller (2002) find a saddle in up to 50% of 32 consumer electronics products in the United States Golder and Tellis (2004) define a "slowdown" (or start of the saddle) as the end of the growth phase in a product's life cycle and find that the slowdown occurs in 96% of a sample of 23 products in the United States

Empirical support for the saddle is based on studies using only U S data Is the phenomenon generalizable across countries? Researchers also propose differing explanations for the saddle Goldenberg, Libai, and Muller (2002) emphasize the role of chasms in adopter segments, however, although they note that changes in technology or macroeconomic events may lead to the saddle, they do not empirically test these explanations Golder and Tellis (2004) emphasize the role of negative cascades, which they measure as change in gross national product

FIGURE 1
Saddle in New Product Sales



As Hauser, Tellis, and Griffin (2006) note, the limited empirical evidence and differing explanations for the saddle underscore the need to thoroughly document and explain this phenomenon across a wider cross section of countries and products Because a saddle involves a sudden and sharp decline in sales that were previously increasing rapidly, accurately testing its generalizability and understanding its drivers has far-reaching managerial implications Such declines may have adverse consequences for managers of new products, who may have overcommitted manufacturing capacity, built large inventories, or expanded their sales staff during the period of growth Worse still, if they believe that the phenomenon is permanent for their product, they may drastically reduce capacity, inventory, or staff and suffer from missed orders and sales when the growth resumes

The goal of this study is to develop a better understanding of the phenomenon of the saddle In particular, we seek answers to three questions

1 How pervasive is the saddle across countries and categories?
2 What are the characteristics of the saddle in terms of start, depth, and duration of decline?

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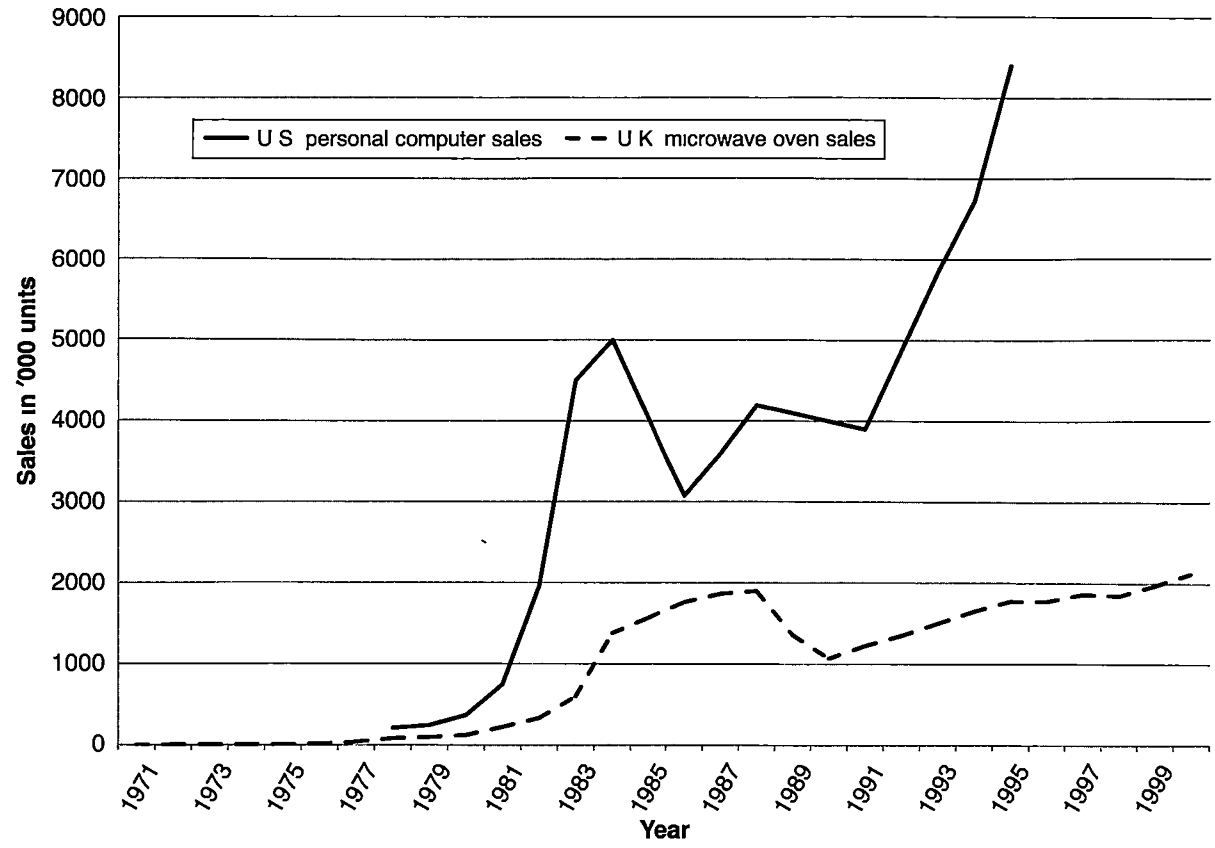
FIGURE 2
Saddles Observed in Sales of Personal Computers and Microwave Ovens



3 What theories explain the saddle?
4 Can a model predict a saddle?

The next section discusses rival theories of the saddle The subsequent three sections present the method, results, and discussion

Rival Theories of the Saddle

Definitions

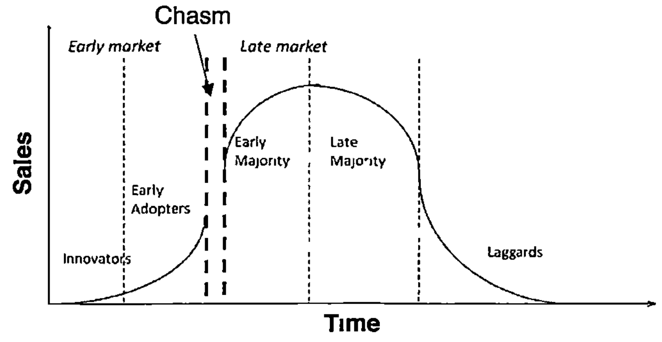
A "product" refers to a group of brands that are close substitutes and fulfill a distinct need from the consumer's viewpoint (Golder and Tellis 2004)—for example, DVD players We use the term "product–country combination" to refer to a specific product in a specific country The term "sales" refers to the total of all consumer purchases of all brands of a specific product "Takeoff" is a dramatic increase in sales that marks the transition from the introduction stage to the growth stage of the product life cycle (Agarwal and Bayus 2002, Golder and Tellis 1997) Linking the phenomenon of the saddle to the concept of takeoff has two advantages First, we avoid considering products that did not make it to a mass market—that is, those that simply failed Second, it can help distinguish characteristics of the saddle compared with takeoff We further define two boundary points of the saddle start and recovery The "start of the saddle" is the first year of decreasing product sales, and "recovery" is the first year in which sales cross the prior initial peak

Chasms in Adopter Segments

Previous research has viewed the product life cycle as a social phenomenon, driven primarily by communication processes that transfer new product information between members of a social system (Golder and Tellis 2004) Rogers (1995) classifies product adopters into five distinct groups (innovators, early adopters, early majority, late majority, and laggards) according to the normal penetration curve The traditional view is that the diffusion process can be fueled by simply targeting the innovators and the early majority, thereby triggering an unbroken word-of-mouth communication process across other adopter segments (Mahajan and Muller 1998, Rogers 1995)

However, some researchers have debated this notion of continuity in the communication process (Goldenberg, Libai, and Muller 2002, Mahajan and Muller 1998, Moore 1991, Van den Bulte and Joshi 2007) Moore (1991) suggests that "cracks in the bell curve" may exist between groups of adopters in the case of high-technology products According to Moore, the biggest crack, or a "chasm," separates the early adopters from the early majority (Figure 3) The early adopters and the early majority have different characteristics and needs, thus, the former do not form a good word-of-mouth reference point for the latter Van den

FIGURE 3
Chasms in Adopter Segments



Bulte and Joshi (2007) point out one implication of this theory Product offerings appealing to technology enthusiasts need not appeal to the mainstream market, thus, mainstream customers discount adoptions by technology enthusiasts and care only about adoptions by other mainstream customers Goldenberg, Libai, and Muller (2002) classify adopter segments as early market and main market according to the timing of new product adoption They argue that weak communication between the early and main markets may lead these segments to adopt products at substantially different rates, in other words, the main market takes off after the early market peaks, thus creating a saddle (Figure 4, adapted from Goldenberg, Libai, and Muller 2002) Following this logic, the literature suggests the following hypothesis

> Alternative H_{A1} A saddle is likely to occur during a discontinuity in the transition between the early and late markets (or a chasm)

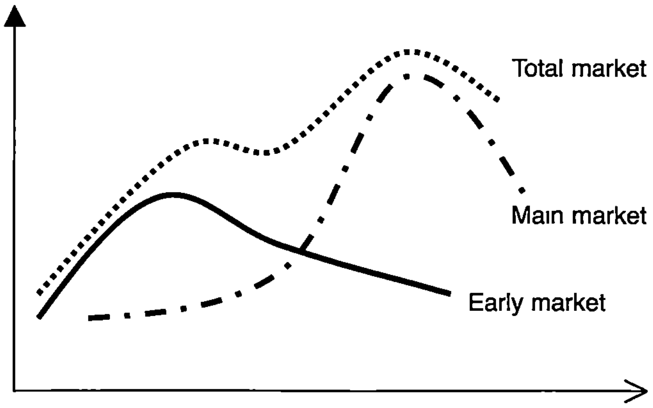
We test this hypothesis against the null hypothesis

> H_0 There is no association between a discontinuity in the transition between the early and late markets (or a chasm) and a saddle

Business Cycles

Prior marketing research has concentrated on the positive impact of income changes on product diffusion (Golder and Tellis 1998, Talukdar, Sudhir, and Ainslie 2002) However, researchers have not studied the differences between the effect of economic contractions on sales of information/entertainment and kitchen/laundry products Recently, researchers have shown the impact of business cycles on the sales of consumer durables (Deleersnyder et al 2004), growth of private labels (Lamey et al 2007), and role of marketing strategy (Srinivasan, Rangaswamy, and Lilien 2005) In the excitement of post-takeoff growth, managers may believe that their new product's sales will be immune to economic contractions and continue to increase However, a saddle may begin even in the growth stage as a result of economic contractions For example, Figure 5 shows the sales of dishwashers (denoted by the dotted line) and economic contractions (denoted by the dark bars) in Germany Note that sales peak in 1973, and the saddle begins in 1974, coinciding with the economic contraction of 1974

FIGURE 4
Saddle Caused by a Chasm



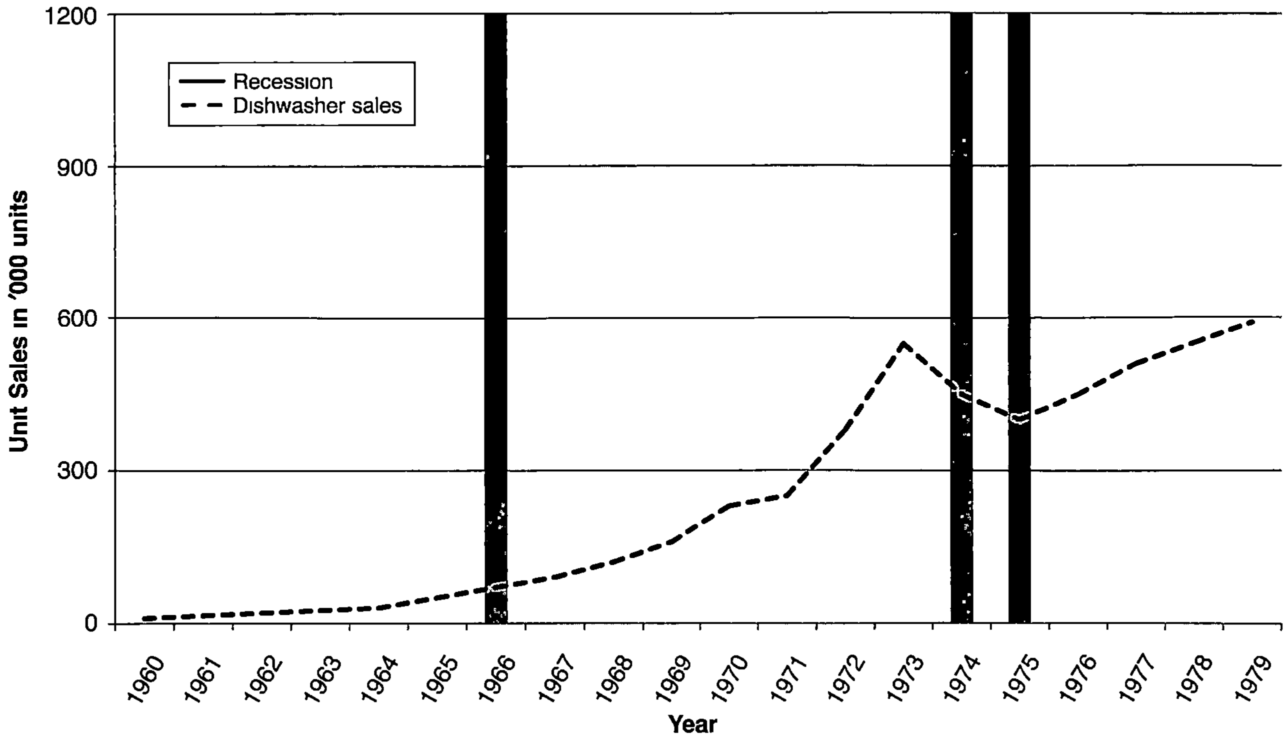
The saddle can occur during periods of economic contractions for four reasons First, an economic contraction shrinks income and depresses buying power As a result, consumers are likely to cut back on discretionary expenditures, such as purchases of consumer durables Second, consumers may lose trust during a contraction more quickly than they gain confidence during the ensuing expansion, leading to cyclical asymmetries in the purchase of durables (Deleersnyder et al 2004, Lamey et al 2007) Third, firms engage in cyclical marketing strategies, such as cutting advertising expenditures (Deleersnyder et al 2004, Lamey et al 2007) or investments (Mascarenhas and Aaker 1989) during contractions These actions can further aggravate the decline in sales during a contraction Fourth, the onset of a recession may trigger a negative cascade in new product sales If a positive cascade first triggers a run-up in sales, when faced with a recession, some consumers may decide to wait before purchasing the new product When other consumers become aware of these decisions, a negative cascade may begin, triggering a sharp drop in sales at the onset of maturity (Golder and Tellis 2004) These reasons point to a strong but previously ignored driver of the saddle in new product sales economic contractions This reasoning suggests the following testable hypothesis

> H_2 A saddle is likely to occur during periods of economic contractions

Technological Cycles

Consumers' beliefs about the significance or size of anticipated improvements in technology may influence new product sales (Balcer and Lippman 1984, Doyle and Saunders 1985, Holak, Lehmann, and Sultan 1987) John, Weiss, and Dutta (1999) argue that whereas significant improvements may prompt purchases when they arrive, they may have a chilling effect when they are expected imminently Consumers may be uncertain about the nature and extent of the technological change and decide to wait and watch (John, Weiss, and Dutta 1999) or may leapfrog a product generation in expectation of product improvements or price declines (Goldenberg, Libai, and Muller 2002, Weiss 1994) Furthermore, Van den Bulte and Stremersch (2004) propose

FIGURE 5
Saddle and Economic Contractions



that when faced with multiple competing standards, even innovative consumers may postpone adoption until the uncertainty about what standard will dominate has been resolved Doyle and Saunders (1985) say that such anticipatory effects may cause even retailers to hold off their purchases in anticipation of changes Thus, a saddle can be expected to begin during times of multiple important technological advances as a result of uncertainty in the minds of consumers and retailers This theory points to a strong but empirically untested driver of the saddle in new product sales technological advances The preceding argument suggests the following testable hypothesis

H_3 A saddle is likely to occur during times of important technological advances

Method

Model

Because the occurrence of the saddle is a time-dependent event with two boundary points, start of the saddle and recovery to initial peak, we model it using two separate split-population hazard models Each hazard model captures one of the two boundary events The standard hazard model explains the conditional probability that an individual i will experience an event in a time period t given that it has not already occurred, as a function of a baseline hazard plus some explanatory variables (Singer and Willett 2003) In new product research, the hazard function has been used to analyze diffusion (Bass 1969) and hazard models have been used to predict takeoff (Agarwal and Bayus 2002, Chandrasekaran and Tellis 2008, Golder and Tellis 1997, 2004, Tellis, Stremersch, and Yin 2003)

The standard hazard model assumes that every case eventually experiences the event (Prins and Verhoef 2007) However, a proportion of the cases may never actually observe the occurrence of the event A split population hazard model allows for some cases never to experience the event (Schmidt and Witte 1989) For example, split population models have been used in the marketing literature to study the diffusion of automated teller machines (Sinha and Chandrashekaran 1992), the emergence of dominant designs (Srinivasan, Lilien, and Rangaswamy 2005), and the adoption timing of a new e-service (Prins and Verhoef 2007)

The discrete-time specification of the hazard model allows for great flexibility in specifying the time function and for incorporating time-varying explanatory variables (Allison 1982, 1995, Singer and Willett 1993) Jenkins (2001) outlines a procedure for a discrete-time split population survival model, which enables us to incorporate time-varying covariates in a discrete time hazard framework while taking into account the possibility that a proportion of the products may never experience the event (either the start of the saddle or the recovery following it) Next, we describe the events and the split population formulations of the model

Events We model two events (1) the start of the saddle given takeoff and (2) the recovery given the start of the saddle The hazard of the start of a saddle is the probability that a product–country combination, i, experiences a start of the saddle in time t, given that it has not done so yet but takeoff has occurred The hazard of recovery is the probability that a product–country combination experiences a recovery past the initial peak, given it has not done so yet but the saddle has started

Each product's history is broken into a set of distinct observations, one for each year, up to and including the year of the event or until the series is censored For each observation, the dependent variable takes on a value of 1 if the event occurs during that period and 0 if otherwise Explanatory variables take on whatever value occurs during that period For the proportion of products for which we observed the event, we have duration data that constitute a complete series However, for the products for which the event is not observed, the observations are interpreted as incomplete series and are censored

Split population formulation Split population models assume that a proportion, c, never experience the event and estimate this unobserved proportion Let A_i be an indicator of whether a product–country combination i eventually experiences the event, where $A_i = 1$ indicates event occurrence and $A_i = 0$ indicates that the event never occurs Let the probability of $(A_i = 1) = 1 - c$ and the probability of $(A_i = 0) = c$

For those product–country combinations in which the event is observed during a given time interval, the contribution to the likelihood is (1 – c) × (probability of survival to end of previous time interval) × (probability of the event in the given interval) Censored observations consist of those that never observe the event plus those not yet observed to fail Thus, the contribution to the likelihood from a censored survival time is c + (1 – c) × (probability of survival to end of the given time interval)

Let d_i be the observable binary censoring indicator signifying whether the ith product–country combination experiences the event in (0, t), with $d_i = 1$ if the event occurs and $d_i = 0$ if right-censored Then we can estimate by maximum likelihood the proportion of product–country combinations that never experience the event, together with the parameters characterizing the hazard rate for the remainder of the population Thus, the likelihood contribution for product–country combination i with survival time t is

$$(1)\quad \ln L_i = d_i \ln[(1-c)(h_{it})(S_{it-1})] + (1-d_i)\ln[c + (1-c)(S_{it})],$$

where S_{it} is the discrete-time survivor function and h_{it} is the (complementary log-log) discrete-time hazard rate, expressed as

$$(2)\qquad S_{it} = \prod_{j=1}^{t}(1-h_{ij})$$

$$(3)\qquad h_{it} = 1 - \exp[-\exp(D(t) + bX_{it})],$$

where D(t) summarizes the duration dependence in the hazard model common to each i We specify a flexible functional form of $D(t) = t + t^2 + \log(t)$ and subsequently test the robustness of the analysis to the linear specification D(t) = t X_{it} consists of the independent variables and control variables, described in the "Measures" subsection

Thus, the hazard function consists of time-varying covariates, time-invariant covariates, and the effect of time If c = 0, a testable hypothesis, the split population survival model reduces to the standard discrete-time proportional hazards model (or complementary log-log model) We use the STATA procedure SPSURV (Jenkins 2001) to estimate the model The estimation procedure uses the maximum-likelihood complementary log-log model to derive starting values The complementary log-log model is particularly useful when data from discrete time intervals are used to capture a continuous underlying process (Allison 1995, Prins and Verhoef 2007)

Measures

Year of takeoff We measure takeoff using the rule Tellis, Stremersch, and Yin (2003) propose They define "takeoff" as the first year in which a product's growth rate relative to its previous year's unit sales is higher than the threshold for takeoff based on market penetration

Boundary points of the saddle We operationalize the two boundary points of the saddle The start of the saddle is the first year of a trough in sales following takeoff, in which sales drop for at least two consecutive years to a depth of at least 10% from an initial peak This rule ensures that we avoid modeling transient sales drops spuriously as a saddle It also ensures consistency across products and countries Our measure is similar to others proposed in the literature For example, Goldenberg, Libai, and Muller (2002) operationalize the saddle as a trough following an initial peak in sales, reaching a depth of at least 20% of the peak (strict definition) or 10% of the peak (relaxed case), lasting at least two years, followed by sales that exceed the initial peak Golder and Tellis (2004) measure slowdown (or start of the saddle) as the first year of two consecutive years, after takeoff, in which sales are lower than the peak of previous sales The end of the saddle, the recovery, is the first year following the start of a saddle in which the sales surpasses the previous peak

Chasm in adopter segments As we mentioned in the section "Rival Theories of the Saddle," prior research has classified adopter categories according to the penetration curve (e g , Mahajan and Muller 1998, Mahajan, Muller, and Srivastava 1990, Moore 1991, Muller and Yogev 2006, Rogers 1995) Muller and Yogev (2006) determine that in a dual-market setting, the main market outnumbers the early market at a penetration level that varies between 3% and 33%, depending on the product Because of this high variation, the point of chasm would vary by product category, though it is likely to be the same across countries Indeed, prior research has shown that diffusion parameters are unique to particular products (e g , Chandrasekaran and Tellis 2007, Muller and Yogev 2006)

Therefore, for each product, a mean penetration level that reflects early market adoption and late market nonadoption can serve as a proxy for the location of the chasm However, theory is silent about the exact penetration percentage at which the chasm is likely located To resolve this problem, we use the data across countries for each product. On the basis of the literature cited previously, we make the reasonable assumption that adopter segments are likely to be common across countries but unique for each product.

Thus, first, we calculate from the data the mean penetration in the year of the saddle across all countries, except the focal country, for each product ("meanpen"). Here, we use the information only from product–country combinations that experience the event. Next, we define a variable "dispersion" to capture the distance of the actual penetration in the year before for the target product–country combination from the mean penetration calculated in the previous step, as follows:

$$\text{Dispersion}_{it} = \text{Abs}(\text{Penetration}_{it-1} - \text{Meanpen}) \tag{4}$$

Note that we use penetration in the previous year and drop the focal country from the calculation of meanpen to allay concerns that the measure is tautological. Hypothesis testing (e.g., Sawyer and Peter 1983) examines the probability of the data if the null hypothesis is true. Now, given that adopter categories are likely to persist across countries for a product, if the null were true, the hazard of a saddle should not increase as distance from meanpen decreases. In contrast, if testing this hypothesis results in a negative coefficient in the hazard model, we would reject the null and conclude in favor of the chasms theory captured by H_{A1}.

Business cycles. We construct a measure to capture economic contractions and expansions using recent marketing literature (Deleersnyder et al. 2009; Deleersnyder et al. 2004; Lamey et al. 2007). These studies estimate business cycles by extracting the cyclical component from the gross domestic product (GDP) series using the Hodrick and Prescott (1997) filter. The Hodrick and Prescott (HP) filter decomposes a time y_t series into a trend component l_t, which varies smoothly over time and a cyclical component c_t, by fitting a smooth curve through a set of points defined by the log-transformed GDP series (Stock and Watson 1999). First, the HP filter obtains the long-term trend and then obtains the cyclical component, which fluctuates around that trend, by subtracting the long-term trend from the original time series (Lamey et al. 2007). We use the software program EViews to estimate the cyclical component of the GDP series for each of the 19 countries, using the HP filter.

Next, we create an indicator variable termed "economic contraction" for the state of the economy. We set this indicator variable to 1 for decreases in the cyclical component of GDP corresponding to contractions and 0 for increases in the cyclical component of GDP corresponding to expansions. A positive coefficient for the measure of economic contraction in the hazard model would imply that a saddle is more likely during an economic contraction than during an economic expansion.

Technological cycles. We measure technological cycles using patenting activity. Prior research has used patents as an important indicator of technological activities and innovation in an industry (e.g., Ahuja and Katila 2001; Tellis, Prabhu, and Chandy 2009). The U.S. patent collection contains the list of all patents issued by the U.S. Patent and Trademark Office since 1974. We consider U.S. patents that have been granted a valid indicator of technological activity for the product across countries because most important innovations either originated in the United States or the firms involved have filed U.S. patents to protect this large market (Tellis, Prabhu, and Chandy 2009). For each product, we extract all U.S. patents from Delphion's patent database, sort the patents according to the Inventive International Patent Classification code, and retain patents that are most directly associated with the focal product.

We have data on both the number of patents and the forward citations received by the patents for each product at each time period. Forward citations refer to the number of times the focal patent is cited by other patents. Trajtenberg (1990) finds a close association between citation-based patent indexes and the social value of innovations from an empirical analysis of a particular innovation (computed tomography scanners). Furthermore, Chandy et al. (2006) argue that patent citations are a valid measure to capture important ideas because they are objective, readily available, and unlikely to be either inflated or understated. Thus, we use the patent citations as an index of the importance or value of the patents. We weight patent counts by this measure, as in Trajtenberg (1990), to create a measure "weighted patent counts" as follows:

$$\text{WPC}_t = \prod_{j=1}^{n_t}(1 + C_j), \tag{5}$$

where n_t is the number of patents issued during the year t and C_j is the number of forward citations received by a patent j for the product. This linear weighting scheme enables us to take into account the number of both citations and patents. A positive coefficient for this measure in the hazard model would indicate that an increase in technological activity is driving the start of the saddle.

Control variables. In a globalized world, consumers' adoption of new products may be influenced by not only communication behaviors among consumers and environment factors within a country but also cross-national learning flows from lead markets (Ganesh and Kumar 1996; Putsis et al. 1997; Takada and Jain 1991). Prior research has pointed out the presence of cross-country learning effects influencing the takeoff of new products (Chandrasekaran and Tellis 2008; Tellis, Stremersch, and Yin 2003; Van Everdingen, Stremersch, and Fok 2009). We control for cross-country learning effects using "prior saddles," or number of saddles that occurred in the previous year in other countries for each product.

Prior research has suggested that greater interconnectivity, media penetration, demographic changes, and technology improvements encourage availability, awareness, and appeal of new products (Chandrasekaran and Tellis 2008; Van den Bulte 2000) and may lead to faster diffusion or takeoff of new products. On the one hand, this may create a cascade in sales for newly commercialized products, leading to an earlier or steeper saddle in sales. On the other hand, newly commercialized products may enjoy a sustained sales momentum, reducing or delaying the possibility of a saddle in sales. We operationalize "product vintage" as the first year in which an innovation was commercialized across all countries in the sample Finally, we control for within-innovation duration dependence by considering "product age," operationalized as the time elapsed since the product was commercialized in each country Following Agarwal and Bayus (2002) and Chandrasekaran and Tellis (2008), we use the word "commercialization" to reflect the fact that databases seem to include a product only when it has become available to the mass market or achieved some minimal level of sales or penetration We look for the earliest year of commercialization for each country from the sales and penetration data for each product in each country We further validate each of these dates by checking that penetration in the year of commercialization has not exceeded 25%, which is a stricter rule than the 5% rule Tellis, Stremersch, and Yin (2003) recommend

Data and Sources

We assembled a database on historical sales and market penetration of both kitchen/laundry and information/entertainment products We obtained data on six kitchen/laundry products (dishwashers, dryers, freezers, microwave ovens, refrigerators, and washing machines) and four information/entertainment products (DVD players, personal computers, VCRs, and video cameras) We tracked these products across 16 European countries (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Ireland, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the UK), Japan, Canada, and the United States, from 1950 through 2008, for a total of more than 1300 observations For the United States, in some cases, we had data extending before 1950 We assembled these detailed time-series data, which are based on several hundred research hours, from a variety of sources subscription-based sources (Euromonitor Global Marketing Information Database, World Development Indicators Online, Fast Facts Database from the Consumer Electronics Association), archival search of several secondary sources (*Historical Statistics of Japan*, *Electrical Merchandising*, *Merchandising*, *Merchandising Week*, and *Dealerscope* journals for the United States, Consumer Europe, European Marketing Data and Statistics), and proprietary industry data

We excluded product–country combinations for which we have fewer than ten years of data We also excluded product–country combinations for which the sales data in the first year exceed 100 (in thousands of units) or the penetration in the first year exceeds 5% For the United States, we dropped washing machines because we do not have early enough data to estimate takeoff As Web Appendix A (http //www marketingpower com/jmjuly11) indicates, the scope of our study is larger than the majority of the prior studies on diffusion of new products, which have typically included either very few products or very few countries, or very few combinations of both The additional challenge in this study was to obtain sales and penetration data As such, this is the one of the largest studies that uses both sales and penetration data (see Web Appendix A)

For calculating the time of economic contractions across countries, we used a measure for real GDP from the Groningen Growth and Development Centre and the Conference Board, Total Economy Database (http //www ggdc netis) We used total GDP, in millions of 1990 U S dollars (converted at Geary Khamis PPPs) We determined GDP for the pre-1950 years from Statistics on World Population, GDP, and per capita GDP, 1–2006 AD (www ggdc net/maddison) We obtained patent data from the Delphion database (www delphion com), a subscription-based database that contains detailed historical records on patents granted and applied for both in the United States and other countries, and has been used in prior studies (e g , Tellis, Prabhu, and Chandy 2009)

Results

Descriptive Statistics

Characteristics of the saddle Of the 156 product–country combinations for which takeoff has occurred, we observe the start of the saddle in 148 cases (99% of the kitchen/laundry products and 88% of the information/entertainment products) These numbers are slightly lower than the 96% Golder and Tellis (2004) report and similar to the 86% Goldenberg et al (2006) report Of the 148 product–country combinations in which the start of the saddle occurs, 120 cases (81%) experience a recovery to the previous peak We observe both the start and recovery in 86% of kitchen/laundry products and 61% of information/entertainment products (Table 1) The numbers observed for the latter are somewhat

TABLE 1
Saddle Occurrences Across Products

Products	Applicable Cases	Start	Recovery	Mean Year of Saddle	Range Year of Saddle
Dishwashers	16	16	15	1980	26
Dryers	18	17	14	1983	45
Freezers	15	15	13	1975	39
Refrigerators	14	14	14	1966	42
Microwave ovens	18	18	12	1993	19
Washing machines	16	16	16	1975	19
Personal computers	15	15	15	1989	8
VCRs	15	15	11	1988	14
Video cameras	15	12	9	1993	5
DVD players	14	10	1	2005	4
Total	156	148	120		

higher than the 33%–50% Goldenberg, Libai, and Muller (2002) report However, our sample is the most global of such studies Of the 156 product–country combinations, 46% experience an average depth of 20% during the saddle and see a recovery to the original peak These include 45% of kitchen/laundry products and 47% of information/entertainment products These numbers correspond to the strict definition of the saddle used in Goldenberg, Libai, and Muller We see censoring in some categories such as DVD players In the censored cases, the saddle either begins at a later point or may never occur The split hazard model can distinguish between these two possibilities

Table 2 presents a description of the key statistics of timing, duration, and depth of the saddle For the 148 product–country combinations that experience the start of the saddle, the average time from takeoff to the start of the saddle is roughly 9 years The average penetration at the start of the saddle is 31%, which is similar to the 34% Golder and Tellis (2004) observe The average time from takeoff to the start of the saddle is 6 7 years for information/entertainment products and 10 3 years for kitchen/laundry products The average penetration at the start of the saddle is 26% for the information/entertainment products and 33% for kitchen/laundry products The average decline in the first year of the saddle for information/entertainment products is 17%, compared with 10% for kitchen/laundry products

The duration of the saddle is the time from the start of the saddle to the recovery, when the sales increase past the initial peak We can trace such a recovery for 120 cases For these 120 cases, the average duration is 8 years (6 6 years for the 36 information/entertainment products and 8 5 years for the 84 kitchen/laundry products that experience a recovery in sales) The relative depth of the saddle is 29% The duration estimates are higher than the average duration of 5 years Goldenberg, Libai, and Muller (2002) report, while the relative depth estimates are comparable to the 32% Goldenberg, Libai and Muller report The average penetration at recovery is 41%, with a standard deviation of 27

Convergence over time Prior research has indicated an increasing convergence in the year of takeoff over time (Chandrasekaran and Tellis 2008), which may be a result of the convergence in the year of commercialization or the underlying drivers over time We find a similar "convergence," or a decrease in the standard deviation of both the year of the saddle and the time from takeoff to saddle over time, for the countries that have experienced the saddle Figure 6 plots the standard deviation in the year of the start of the saddle across product vintage (the year of first commercialization of each product category), as well as the standard deviation in the time from takeoff to saddle in years across product vintage We observe a downward trend and a dramatic drop in the standard deviation of year of saddle over time This drop indicates that various countries increasingly experience the start of the saddle at the same time We see a downward but more gradual trend in the standard deviation in time to saddle This drop indicates an increasing similarity across countries in the time span between takeoff and saddle To understand the reasons behind the start of the saddle and the subsequent recovery, we next examine the estimates of the split population hazard model, separately for the start and end of saddle

Hazard of Start of Saddle

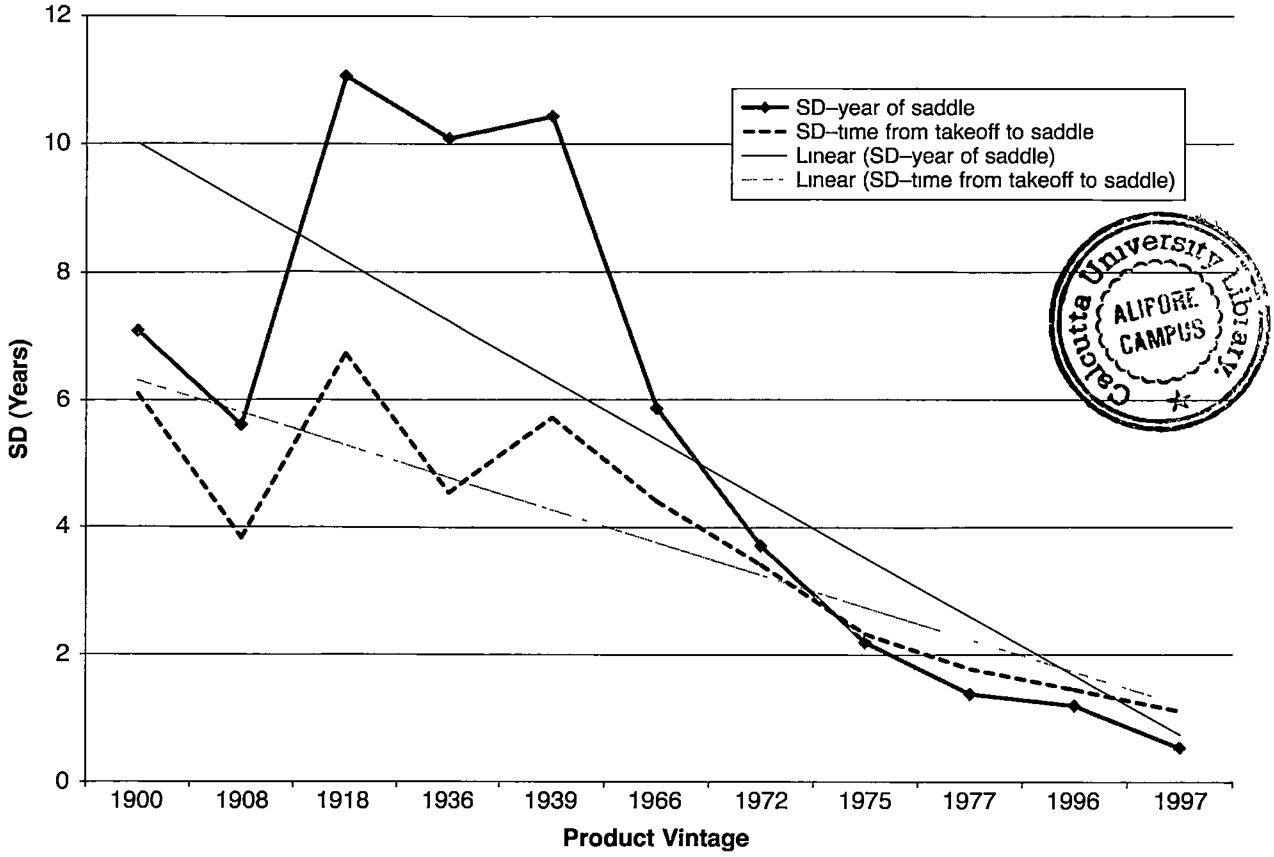
Prior literature has highlighted distinct differences across product classes in terms of their diffusion patterns (Chandrasekaran and Tellis 2008, Tellis, Stremersch, and Yin 2003) In our sample, we also find substantial differences in the descriptive statistics and occurrence of saddles across product class Therefore, we examine the results of the split population hazard model separately by product class Subsequently, we discuss the model's performance Web Appendix B (http //www marketingpower com/jmjuly11) presents the correlation matrixes To examine a potential concern about the independence of product categories across countries, we also examine the correlations for the year of saddle, and time to takeoff, across countries Although the correlations are high, they are not close to 1, indicating some independence across the categories

Information/entertainment products Table 3 presents the results of estimating the hazard model for the start of saddle Model 1 is the split-population model for information/entertainment products The estimated probability of never seeing a saddle is 2% for information/entertainment products The likelihood ratios test of whether c = 0 is imple-

TABLE 2
Descriptive Statistics

	Takeoff to Saddle (Years)	% Sales Decline at Saddle	Penetration at Saddle	Relative Depth (%)	Time to Recovery (Years)
Information/Entertainment Products					
M	6 76	–16 75	25 81	32	6 55
SD	2 50	17 05	21 98	13	3 45
Count	52	52	52	36	36
Kitchen/Laundry Products					
M	10 35	–9 88	32 90	28	8 43
SD	5 51	9 60	25 13	8	6 19
Count	96	96	96	84	83
Overall					
M	9 09	–12 29	30 40	29	7 86
SD	4 97	13 08	24 36	10	5 56
Count	148	148	148	120	120

FIGURE 6
Standard Deviation of Year of Saddle and Time from Takeoff to Saddle by Vintage



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mented as a boundary-value test (Jenkins 2001) The results of the chi bar–squared test statistic from the likelihood ratio test of H_0 c = 0 versus H_1 c > 0 finds that the Prob ≥ chibar2 = 06 We find that the split population model has a lower log-likelihood (–128 5), and a lower Akaike information criterion (AIC) statistic (275 91) than the log-likelihood (–129 57) and AIC (277 13) reported from a standard discrete time proportional hazards model estimated on the same data These results justify the appropriateness of the use of the split-population hazard model rather than the standard hazard model

TABLE 3
Results of Split Population Model for Start of Saddle

Explanatory Variables	(1) Information/ Entertainment Products	(2) Kitchen/ Laundry Products
Product vintage	038* (1 86)	– 003 (– 50)
Product age	1 904*** (3 46)	044 (16)
Age square	– 049*** (–3 10)	– 001 (– 27)
Log(Product age)	–6 133*** (–3 00)	881 (33)
Economic contraction	144 (49)	820*** (3 61)
Dispersion	– 033** (–1 97)	– 017 (–1 38)
Weighted patent counts	0004** (2 24)	001** (2 25)
Prior saddles	082 (70)	220** (2 56)
Constant	–76 044* (–1 91)	– 869 (– 08)
Observations	400	727
Log-likelihood	–128 5	–236 1

*p< 1
**p< 05
***p< 01
Notes z–statistics are in parentheses

The results from Model 1 indicate that the coefficient of product age is positive and significantly different from zero, while age square and log age have negative and significant coefficients The coefficient of prior saddles is not significantly different from zero The effect of dispersion from the mean penetration at saddle is negative and significantly different from zero This result leads us to reject the null hypothesis in favor of the alternative hypothesis H_{A1} (a saddle is likely to occur during a discontinuity in the transition between the early and late markets) Therefore, chasms are likely to lead to the start of a saddle for information/entertainment products The effect of economic contraction is not significantly different from zero This result does not support H_2 (a saddle is likely to occur during periods of economic contractions) The coefficient of weighted patent counts is positive and significantly different from zero, supporting H_3 (a saddle is likely to occur during times of important technological advances) In summary, for information/entertainment products, we find support for two explanations leading to the saddle chasms in adopter segments and technological cycles

Kitchen/laundry products Model 2 in Table 3 presents the results for estimating the hazard of the start of the saddle for kitchen/laundry products The estimated probability of never seeing a saddle is so small that the split population hazard model reduces to a standard proportional hazard model, which assumes $c = 0$ This result implies that all kitchen/laundry products are at risk for experiencing a saddle Furthermore, this result has face validity in that a saddle occurs in 98% of the kitchen/laundry products

In Model 2 for kitchen/laundry products, we do not find a significant effect for product vintage or the specifications for product age We find a positive and significant effect for prior saddles, indicating that the hazard of a saddle increases significantly with the number of prior saddles in other countries We do not find a significant effect for dispersion from mean penetration, thus, we do not find support for H_{A1} The positive and significant coefficient for economic contraction indicates that the hazard of the saddle is significantly higher during periods of economic contractions, consistent with H_2 The coefficient of weighted patent counts is positive and significantly different from zero Therefore, the hazard of a saddle increases significantly during times of important technological advances, consistent with H_3 In summary, for kitchen/laundry products, we find empirical support for two explanations, controlling for duration dependency and cross-country learning effects

Model performance and out-of-sample prediction The likelihood ratio tests and consistency of the model with the hypotheses provide support for the validity of the model To ascertain the out-of-sample predictive validity of the hazard model, we use a jackknife approach (similar to Golder and Tellis 1997) in the following way We reestimate Equation 1 with the variables showing significant effects, n times, for each of the n products for which a saddle occurs, each time excluding one product Then, we use the estimated parameters of the model to predict the hazard of the start of the saddle for the excluded product The linear prediction is based on the value of the independent variables of the excluded product for that year and country We determine the estimated year of the start of the saddle to be when the probability of no saddle (the survival probability) falls below 60% The estimate for survival probability S_{it} after one year is $(1 - h_{i1})$, after two years is $(1 - h_{i1})(1 - h_{i2})$, and so on (Golder and Tellis 1997) Recall that we use a split population hazard model For this model, we account for the split population probability by refining the survival probability as $c + (1 - c) \times S_{it}$, where c is computed from each iteration of the estimation

Using this approach, we make a prediction for the start of the saddle, for each product-country combination We compute the mean absolute deviation (MAD) in start of the saddle according to the differences between the predicted year and actual year of the start of the saddle across these product–country combinations We carry out this analysis for four recent products in 19 countries, which actually experience a saddle The mean absolute deviation in predicted start of the saddle is 2 4 years This error is comparable to similar out-of-sample predictions hazard models, such as 2 years in Golder and Tellis (1997) and 2 5 years in Srinivasan, Lilien, and Rangaswamy (2005)

Hazard of Recovery

The analysis of the hazard of recovery uses the 148 product–country combinations that experience the start of the saddle We observe a recovery in 120 product–country combinations Again, we run the split population hazard model separately by product class We control for the effects of time using three variables "time since the start of the saddle" to account for duration dependence, the "year of commercialization" of a product in a country, and the "time from commercialization to saddle" to account for any dependence of duration with the prior event We control for cross-country learning effects by including a variable "prior recoveries," which is the number of recoveries that occur in the previous year in other countries for each product We examine the impact of business cycles and technological cycles using the measures described previously. For business cycles, we use the variable "economic expansion," rather than "economic contraction" for ease of exposition

Table 4 shows the estimates of the model for recovery for information/entertainment and kitchen/laundry products For information/entertainment products (Model 3), all three time indicators are significantly different from zero Time since the start of saddle has a positive and significant coefficient This result indicates that as the time since the start of the saddle increases, the product is more likely to see a recovery The coefficient of year of commercialization is negative and significantly different from zero This result indicates that a recovery is less likely in the observation period for those products that were commercialized later Both these results are validated by the high censoring in recovery for newly introduced information/entertainment products For example, in the case of the DVD player, we observe a recovery in just one of ten countries in which the saddle begins The coefficient of time from commercialization to saddle is negative and significant, indicating that as the time to saddle decreases, the hazard of recovery increases The estimate for prior recoveries is positive and significant, indicating that a prior recovery in another coun-

TABLE 4
Results of Split Population Hazard Model for Recovery

Explanatory Variables	(3) Information/ Entertainment Products		(4) Kitchen/ Laundry Products	
Year of commercialization	– 220***	(–2 73)	– 022	(–1 27)
Time since start of saddle	222***	(3 73)	009	(51)
Economic expansion	253	(73)	440*	(1 82)
Weighted patent counts	0002**	(2 54)	000	(04)
Time from commercialization to saddle	– 165**	(–2 05)	– 017	(– 85)
Prior recoveries	270**	(2 44)	– 341*	(–1 87)
Constant	433 038***	(2 72)	4 794	(1 19)
Observations	362		837	
Log-likelihood	–104 3		–242 0	

*p < 1
**p < 05
***p < 01
Notes z–statistics are in parentheses

try may trigger a recovery in the focal country The coefficient of economic expansion is not significantly different from zero The coefficient for weighted patent counts is significant and positive, indicating that significant technological advances that occur during the saddle triggers recovery However note that this variable has a positive sign for both the start of the saddle and the recovery, contrary to what may be expected We discuss this result in a subsequent section

Furthermore, the estimate of c is 11, indicating that 11% of the product–country combinations may never experience a recovery in sales The results of the chi bar-squared test statistic from the likelihood ratio test of H_0 c = 0 versus H_1 c > 0 finds that the Prob ≥ chibar2 = 03 For example, VCRs in Portugal and Spain experienced some growth after the start of the saddle but never recovered their initial peaks Both products experience a decline in product sales by the end of the observation period

In contrast, for kitchen/laundry products (Model 4), we find we only gain some insight on what may drive their recovery with the variable economic expansion ($p <$ 10) To provide further support for this result, 60% of the products in this category see a recovery during times of economic expansion The estimate of c is close to 0 This result implies that all kitchen/laundry products eventually experience recovery

Test of Robustness

Alternative measure of saddle We first test the robustness of our results to an alternate measure of the start of the saddle proposed by Golder and Tellis (2004) and Stremersch and Tellis (2004), which they term as slowdown These authors operationalize start of the saddle as the first year of two consecutive years, after takeoff, in which sales are level with, or lower than the highest previous sales We find 159 occurrences of the event using this rule, and in 25 cases (16%), we identify an earlier year of the start of the saddle with this new measure We rerun the regressions using this new rule for the start of the saddle For both product classes, the split population model does not converge, and we use the standard discrete-time proportional hazards model For information/entertainment products, the results (Model 1 in Web Appendix C at http //www marketingpower com/jmjuly11) show support for the chasms theory but not the theories of economic or technological cycles For kitchen/laundry products (Model 2 in Web Appendix C), the results show support for all three theories However, the measure for the start of the saddle does not require a fixed percentage drop for the saddle to occur and thus is a weaker measure Moreover, the model based on this measure is unable to detect a significant proportion where the event never occurs Thus, our original measures provide a better test of the three theories

Alternative measure of economic cycles We test the robustness of the analysis to an alternate measure capturing economic cycles, using economic growth rather than economic contraction, which is based on the Hodrick and Prescott (1997) filter We use the percent growth rate in GDP to capture economic cycles, similar to Golder and Tellis (2004) Next, we create an indicator variable termed "economic growth contraction" for the state of the economy We set this indicator variable to 1 for decreases in the growth rate of GDP corresponding to contractions and 0 otherwise A positive coefficient for this measure in the hazard model would imply that the likelihood of a saddle increases during periods of lower economic growth The results for information/entertainment products indicate support for the explanations of chasms and technological cycles, similar to Table 3, as well as economic cycles (Model 3 in Web Appendix C at http //www marketingpower com/ jmjuly11) For kitchen/laundry products (Model 4 in Web Appendix C), using the discrete-time proportional hazard model, we find support for the theories of economic and technological cycles only, consistent with the prior results

Alternative hazard model specification We examine the robustness of the analysis of the start of the saddle to the presence of unobserved heterogeneity Using the same data set, we estimate by maximum likelihood two discrete time proportional hazards regression models, one for kitchen/ laundry products, one for information/entertainment products, incorporating a gamma mixture distribution to summarize unobserved individual heterogeneity

Specifically, the discrete time hazard rates for product–country combination i in each duration interval $t = 1, \quad , t\_i$ are as follows

$$h_{it} = 1 - \exp\{-\exp[D(t) + bX_{it} + \log(e_i)]\}, \tag{6}$$

where X_{it} is a vector of covariates, b is a vector of parameters to be estimated, D(t) is a function describing duration dependence in the hazard common to each i, and e_i is a Gamma distributed random variable with unit mean and variance $v = s^2$ We specify a flexible functional form of the duration dependence as $D(t) = t + t^2 + \log t$, consistent with Table 3 We use the PGMHAZ procedure developed by Jenkins (1997) in STATA to estimate the models

The results are in Models 5 and 6 in Web Appendix C The size of the variance of the gamma mixture distribution relative to its standard error suggests that unobserved heterogeneity is not significant in this data set The split population models in Table 3 have lower log-likelihoods and AIC scores, in addition to being able to detect the proportion of products that never experience the saddle

Inclusion of product-specific and regional dummies We include product specific dummies to capture the effects of any product-specific variable not accounted for in our data (Models 7 and 8 in Web Appendix D at http // www marketingpower com/jmjuly11) The results for both information/entertainment and kitchen/laundry products remain consistent with prior results The split population hazard model for information/entertainment products do not detect a significant proportion of cases in which the saddle does not occur Similarly, we include region-specific dummies and the results remain consistent (Models 9 and 10 in Web Appendix D) The results remain substantially similar to prior results The split population hazard model for information/entertainment products do not detect any significant proportion of cases in which the saddle do not occur

Inclusion of a different specification of time We test the robustness of the analysis to the inclusion of a linear specification of time (D(t) = t) in the hazard model (Models 11 and 12 in Web Appendix D). The results for information/entertainment products remain consistent with prior results. We determine a c of 6% with a Prob ≥ chibar2 = .00. The results for kitchen/laundry products are substantially similar. The coefficient of dispersion is now negative and significantly different from zero, indicating support for all three theories for kitchen/laundry products.

Discussion

Key Findings

A saddle is a phenomenon characterized by a sudden, sustained, and deep drop in sales of a new product, after a period of rapid growth following takeoff, followed by a gradual recovery to the former peak. We model both turning points of the saddle. We explore the generalizability of the saddle across an extensive data set of 156 product–country combinations (from ten categories across 19 countries) over several decades. This presents as yet the most comprehensive study of this phenomenon. Our key empirical findings are as follows:

1. The saddle is pervasive across countries. The onset of the saddle occurs in 148 of 156 product–country combinations.
2. The average time from takeoff to start of the saddle is 9 years, and average depth of the saddle is 29%. The average penetration at saddle is 26% for the 52 information/entertainment products that experience a saddle and 33% for the 96 kitchen/laundry products that experience a saddle.
3. The duration of the saddle is 6.6 years for the 36 information/entertainment products and 8.5 years for the 84 kitchen/laundry products that experience a recovery in sales.
4. There is a growing convergence in the year of the saddle and the time from takeoff to saddle over time and across countries.
5. For the start of the saddle, results support the explanations of chasms and technological cycles for information/entertainment products and the explanations of business cycles and technological cycles for kitchen/laundry products.
6. Recovery to the initial peak occurs in 120 of the 148 product–country combinations that experience a saddle, with the others being censored.
7. The results indicate that a recovery for information/entertainment products is influenced by the year of commercialization, time from the start of the saddle, time from commercialization to the start of the saddle, and technological cycles, but not economic expansions; in contrast, a recovery for kitchen/laundry products may be influenced by economic expansions.

Contributions

Why does the saddle occur? Our review of the literature identifies three explanations for the saddle: chasms in adopter segments, business cycles, and technological cycles. For kitchen/laundry products, we find support for two explanations: business cycles and technological cycles. For information/entertainment products, we find support for two explanations: chasms in adopter segments and technological cycles.

We make an important theoretical contribution by building a common bridge across the differing explanations for the saddle. Prior research has posited conflicting explanations for the saddle. Golder and Tellis (2004) find that GDP growth, which they use to measure information cascades, has an important impact on the saddle, while Goldenberg, Libai and Muller (2002) support the chasms explanation. The latter authors also mention that technological factors may drive the saddle but do not test this explanation. By analyzing product classes separately, we find that economic cycles, technological cycles, and chasms in adopter segments are all valid explanations but that they have a *differential* impact across product classes.

The impact of business cycles on the occurrence of the saddle is significant for kitchen/laundry products but not significant for information/entertainment products. There are two probable reasons for these findings. First, in general, kitchen/laundry products are higher-priced than information/entertainment products and thus are more susceptible to economic contractions. Second, information/entertainment products are more visible and socially significant and thus less susceptible to economic contractions. Moreover, we find that for information/entertainment products, recovery is not related to periods of economic expansion. However, for kitchen/laundry products, recovery is more likely to occur during periods of economic expansion. This finding supports prior studies that have established a close relationship between sales and economic growth (e.g., Deleersnyder et al. 2004). However, our contribution is that we found an asymmetric impact of economic cycles on the two classes of products. Moreover, compared with the typical length of economic contractions lasting anywhere between 6 and 16 months (reported by the National Bureau of Economic Research) the duration of the saddle is substantially longer lasting—on average, 6.5 years for information/entertainment products and 8.5 years for kitchen/laundry products.

The impact of dispersion, capturing the communication chasm between adopter segments, seems to matter for information/entertainment products but not kitchen/laundry products. A probable reason is that the differences in the innovativeness and characteristics across consumer adopter segments may be stronger for information/entertainment products, which tend to be high technology products. For kitchen/laundry products, which are less visible, word-of-mouth communication may be stronger and sustained and thus less discontinuous.

We make an important contribution by modeling the second boundary point of the saddle: recovery. For the categories that do experience the start of a saddle, we examine whether recovery occurs and the factors driving such a recovery, using a second split population discrete time hazard model. The split population hazard model indicates that a full recovery may not always occur for information/entertainment products. Thus, what may appear to be a temporary saddle may in certain conditions lead to a permanent decline in the product category. We observe this phenomenon in some instances for the VCR product category and conjecture that the likely recovery was thwarted by the takeoff of sales of the DVD player. Similarly, our operationalization of both boundary points allows us to account for potential saddles in recent products, such as the DVD player. In the United States, a lead market, our data indicate that DVD players have seen both the slump and the recovery. Such a recovery is widely expected in other countries, from our reading of individual countries' product reports Furthermore, from a modeling perspective, our analysis indicates that it is important to account for the notion that certain products may never experience the start of a saddle, or if they do, may never experience a recovery to the former peak Our study is the first to use the split population model to examine these turning points in the product life cycle

Implications

The findings of our study may provide managers with a better understanding on the processes that underlie diffusion in the early stages of the product life cycle There are four main implications of these findings First, our study indicates that the saddle is a fairly pervasive phenomenon that affects most new products Thus, growth is not perennial At the same time, recovery is also very likely We provide a model to determine the hazard of these two events and a set of explanatory variables that determine what drives these events Using the values of the independent variables for a new product and estimates of the parameters of the significant coefficients of the hazard model published here, managers can use the model to predict the hazard of the start or end of the saddle for their own new product In addition, this study provides statistics that indicate the occurrence, depth, and duration of the saddle Managers can use such predictions and statistics to better plan manufacturing, inventory, and marketing for recovery from the phenomenon or to sustain continuity of new product growth

Second, managers should be cognizant of the systematic differences between kitchen/laundry products (and perhaps other similar utilitarian products) and information/entertainment products Although product managers may worry that an economic recession may lead to a reversal in growth of a new product category, our analysis suggests that producers of information/entertainment products may need to worry less about the specific impact of recessions, compared to producers of kitchen/laundry appliances However, they may need to devote more attention to generating a sustained word-of-mouth momentum Producers and marketers of kitchen/laundry products may need to pay greater attention to the impact of economic cycles

Third, our findings point out a dramatic convergence in some aspects of the saddle across countries These findings, coupled with previous findings on convergence of takeoff of new products, suggest increasing synchronization of new product growth across countries We suspect that this phenomenon could result from greater globalization in addition to synchronization of launch strategies across countries Although global companies can hope to balance slowing sales in one country with growth in another country, simultaneous or near saddles may pose a grave challenge to new product managers, especially of kitchen/laundry products Global marketing managers should be cognizant of saddles and recoveries in all countries Fourth, our analysis suggests that technological innovations are an important driver of the recovery from a saddle Thus, managers should consider the importance of innovation for recovery, in addition to the traditional marketing mix variables of pricing and advertising

Limitations

This study has some limitations First, our dispersion measure is a heuristic that does not directly capture the discontinuities in word-of-mouth communication across adopter segments Instead, it is a proxy that captures the location of the chasm However, our results map on to some of the key findings from multi-segment sales diffusion models from earlier studies (e g , Goldenberg, Libai, and Muller 2002, Muller and Yogev 2006) There is a need for in-depth surveys to trace and analyze such points of transitions and contribute to our understanding of chasms Second, our data do not enable us to control for several marketing variables such as price, advertising, and distribution Third, we do not analyze the impact of entry and exit of firms during takeoff and growth, because these data are not available across countries for this extended time period Fourth, we could not measure information cascades directly as an explanation of the saddle All these remain useful areas for further research

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Lucia Malär, Harley Krohmer, Wayne D. Hoyer, & Bettina Nyffenegger

Emotional Brand Attachment and Brand Personality: The Relative Importance of the Actual and the Ideal Self

Creating emotional brand attachment is a key branding issue in today's marketing world. One way to accomplish this is to match the brand's personality with the consumer's self. A key question, however, is whether the brand's personality should match the consumer's actual self or the consumer's ideal self. On the basis of two empirical studies of 167 brands (evaluated by 1329 and 980 consumers), the authors show that the implications of self-congruence for consumers' emotional brand attachment are complex and differ by consumers' product involvement, consumers' individual difference variables, and the type of self-congruence (fit of the brand's personality with the consumer's actual self versus with the consumer's ideal self). On a general level, actual self-congruence has the greatest impact on emotional brand attachment. Product involvement, self-esteem, and public self-consciousness increase the positive impact of actual self-congruence but decrease the impact of ideal self-congruence on emotional brand attachment. The authors discuss important managerial and academic implications of these findings.

Keywords: emotional brand attachment, brand personality, self-congruence, actual self, ideal self, product involvement, self-esteem, public self-consciousness

Increasingly, companies are searching for ways to create strong emotional brand connections with consumers. This is motivated by the finding that such connections lead to higher levels of consumer loyalty, which increases company financial performance (Park et al. 2010). For example, cosmetics companies have communicated for years to consumers that using their products will make them more attractive and beautiful and bring them closer to realizing an ideal vision of themselves (an "ideal self"). More recently, however, Unilever's Dove line has used models who are more average in appearance, presumably corresponding more closely to how the majority of consumers actually see themselves (an "actual self"). This approach hit a nerve with many consumers, causing them to form a strong emotional connection with the brand. Thus, the "actual self" seems to be growing in importance to consumers looking for reality and authenticity in marketing messages (Gilmore and Pine 2007), and many marketing managers seem to increasingly favor an authentic approach to branding. Nevertheless, other companies still create emotional connections with campaigns that focus on ideal beauty. In other words, the "ideal self" seems to remain important because many consumers like brands that do not fit with their actual reality but, rather, represent an aspiration (as a means of self-improvement, Sirgy 1982). Thus, both strategies could be effective, depending on the situation. In light of this, a key question is which strategy to use and when to use it to strengthen emotional brand attachment.

A key concept for investigating this question is the concept of "self-congruence" (i.e., a fit between the consumer's self and the brand's personality or image, Aaker 1999, Sirgy 1982). It has been suggested that self-congruence can enhance affective, attitudinal, and behavioral consumer responses to the brand (e.g., Aaker 1999, Grohmann 2009). In particular, because the consumer's self-concept must be involved for an emotional brand attachment to occur (Chaplin and John 2005, Park et al. 2010), self-congruence should play an especially prominent role in creating emotional brand attachment.

To the best of our knowledge, however, no study has investigated which consumer's self is best to target in particular situations to increase emotional brand attachment. When should marketers emphasize a brand personality related to aspirations (i.e., tailored to the consumers' ideal self), and when should they pertain to the real (actual) self of consumers? Thus, our study has two research objectives

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(1) to understand the implications and the relative impact of consumers' actual versus ideal self-congruence on emotional brand attachment and (2) to gain insight into how the effect of actual versus ideal self-congruence on consumers' emotional brand attachment varies across different contexts and consumers.

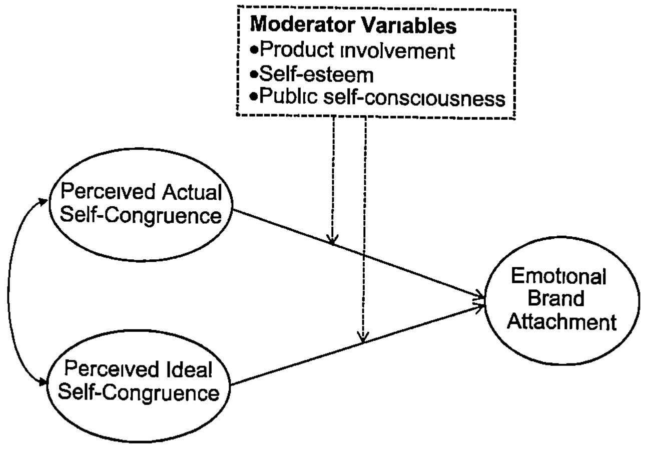
Previous research on consumer–brand relationships has clearly demonstrated that understanding the emotional components of such relationships is highly relevant to both marketing academics and practitioners (e.g., Fournier 1998). The feelings that a brand generates have the potential to strongly differentiate one brand from another, especially as consumers usually emotionally attach to only a limited number of brands (Thomson, MacInnis, and Park 2005). Our first objective contributes to the knowledge regarding the development of such an emotional brand attachment. According to Park et al. (2010, p. 36), "Given the uniquely strong effects of brand attachment…, additional research is needed on how marketers can enhance brand attachment." In terms of our second objective, we examine the consumers' product involvement, self-esteem, and public self-consciousness as moderators of the relationship between (actual and ideal) self-congruence and emotional brand attachment. This second research objective is especially relevant for marketing managers in providing guidance on which strategy to use in a particular situation.

Conceptual Framework

Figure 1 presents our conceptual framework. Note that both actual and ideal self-congruence affect the consumer's emotional brand attachment. However, the influence of actual and ideal self-congruence may vary, depending on the consumer's level of product involvement, self-esteem, and public self-consciousness.

Our central assumption is that consumers use products as a way to define themselves to others and purchase brands with a particular personality to express their self-concept (Aaker 1999, Belk 1988). The concept of brand personality attributes human characteristics or traits to a brand on the basis of a consumer's perception of that brand (Aaker 1997, Geuens, Weijters, and De Wulf 2009, Grohmann 2009). Specifically, it has been suggested that brand personality can be instrumental in helping consumers express their self-concept and provide a sense of comfort to consumers who have found a brand that "fits" their self-concept (Aaker 1999, Sirgy 1982).

FIGURE 1
Proposed Framework Linking Self-Congruence to Emotional Brand Attachment


Moderator Variables
•Product involvement
•Self-esteem
•Public self-consciousness
Perceived Actual Self-Congruence
Perceived Ideal Self-Congruence
Emotional Brand Attachment

The self-concept is defined as the cognitive and affective understanding of who and what we are and can take two forms: the "actual self" and the "ideal self." The actual self is based on the perceived reality of oneself (i.e., who and what I think I am now), whereas the ideal self is shaped by imagination of ideals and goals related to what a person believes that he or she would like to be or aspire to become (Lazzari, Fioravanti, and Gough 1978, Wylie 1979). Either way, the consumer can achieve self-congruence by consuming a brand with a personality that he or she regards as similar to either the actual or ideal self. Actual self-congruence reflects the consumer's perception of the fit between the actual self and the brand's personality, whereas ideal self-congruence is the perceived fit of the brand personality with the consumer's ideal self (Aaker 1999). An actually self-congruent brand reflects who the consumer actually is ("this brand's personality is like who I really am"), whereas an ideally self-congruent brand reflects who the consumer would like to be ("this brand's personality is like who I would like to be").

The dependent variable in our framework is "emotional brand attachment." In psychology, attachment is an emotion-laden bond between a person and a specific object (Bowlby 1979). In a marketing context, people can also build and maintain emotionally charged relationships with brands (Belk 1988, Fournier 1998). Thus, emotional brand attachment reflects the bond that connects a consumer with a specific brand and involves feelings toward the brand. These feelings include affection, passion, and connection (Thomson, MacInnis, and Park 2005), which represent "hot" affect from the brand's linkage to the self (Mikulincer and Shaver 2007).

We examine three moderators of the relationship between the type of self-congruence and emotional brand attachment: product involvement, self-esteem, and public self-consciousness. As we argue in the "Hypotheses" section, each of these variables has an important motivating impact on the link between self-congruence and emotional brand attachment. Understanding these interaction effects can have important implications for the design and implementation of a brand personality.

Product involvement has important implications for consumer information processing and has been shown to be an important contingency variable for the success of various marketing strategies and activities (e.g., MacInnis and Park 1991, Petty and Cacioppo 1986). According to Celsi and Olson (1988, p. 211), "a consumer's level of involvement with an object, situation, or action is determined by the degree to which s/he perceives that concept to be personally relevant" (see also Zaichkowsky 1985). Similarly, Park and Young (1986, p. 11) state that "most researchers agree that the level of involvement can be understood by the degree of personal relevance or importance." In addition, Richins and Bloch (1986) define involvement in terms of the consumer's degree of interest or arousal for a given product On the basis of these previous studies, we define product involvement as the personal relevance of the product, which is determined by the extent to which the product is interesting and important to the consumer

When personally relevant knowledge is activated in memory, a motivational state is created that energizes or drives consumers' cognitive behavior (e g , attention, comprehension, information search, Celsi and Olson 1988) or affective responses (e g , emotions, Park and Young 1986) Thus, product involvement is perceived by consumers rather than inherent within the product itself Although there are products that on average (across various consumers) are high or low involvement, the actual level of involvement is still defined individually In other words, involvement resides within the consumer but is influenced by the product For example, most people would consider Procter & Gamble's product line to consist of "low-involvement products" (e g , soap, laundry detergent), but the firm has two panels of 750,000 consumers (one of teenagers, the other of mothers) who advise the company about its brands on a regular basis through the Internet Clearly, these products are of higher involvement for these people (Marsden 2006)

Self-esteem refers to a person's overall evaluation of his or her worthiness as a human being (Rosenberg 1979) Traditionally, self-esteem has been conceptualized as a unidimensional construct that represents an "overall positive-negative attitude toward the self" (Tafarodi and Swann 1995, p 322) People with high self-esteem like, value, and accept themselves, imperfections and all Low self-esteem represents an unfavorable definition of the self However, each of us is strongly driven to feel good about ourself, and we try to maintain and enhance our self-esteem (for a review, see Wylie 1979) In the current context, one way to do so is to consume brands that are congruent with either our actual or ideal self-view (Sirgy 1982)

Fenigstein, Scheier, and Buss (1975) conceptualize public self-consciousness as the awareness of the self as a social object or the awareness that others are aware of the self Thus, people with high public self-consciousness are more aware of how others perceive them and try harder to create a favorable public image (Scheier 1980) Public self-consciousness has been used previously in consumer behavior contexts to assess a person's awareness of and concern with his or her self-image and self-appearance in public (e g , Gould and Barak 1988) Because self-image is important to publicly self-conscious people, we assume that this variable will moderate the relationship between type of self-congruence and emotional brand attachment

Hypotheses

Main Effects of Actual and Ideal Self-Congruence on Emotional Brand Attachment

Our first two hypotheses refer to the impact of actual and ideal self-congruence on emotional brand attachment On a general level, we can state that the brand's personality (which is the point of reference for self-congruence) provides the basis for the consumer's affection toward the brand by animating and humanizing the underlying brand (Fournier 1998) Some basic theoretical arguments support the impact of actual and ideal self-congruence on emotional brand attachment First, self-congruence belongs to a broader class of cognitive-consistency theories (Festinger 1957, Heider 1946) that suggest that people strive for consistency in their beliefs and behaviors because inconsistency produces feelings of unpleasantness and tension Applying these theories to the current context, consumers are motivated to hold a set of beliefs about themselves (self-concept) that motivate them to act in ways (e g , prefer, purchase, and use brands with a matching brand personality) that reinforce their self-concept

Furthermore, self-expansion theory (Aron et al 2005) posits that people possess an inherent motivation to incorporate others (in our context, brands) into their conception of self The more an entity (brand) is part of a person's self-definition, the closer is the emotional bond In the consumer behavior literature, emotional attachment has been inherently tied to the consumers' self-concept (Kleine, Kleine, and Kernan 1993) Some scholars have argued that brand attachment depends on the degree to which consumers view the brand as being part of themselves and reflecting who they are (e g , Park et al 2010) The more the brand reflects the consumer's self (i e , self-congruence) and the greater the personal connection the consumer feels between the self and the brand, the stronger his or her brand attachment becomes

The general arguments we have discussed apply to both actual and ideal self-congruence What differentiates them is the underlying motive In terms of actual self-congruence, self-verification theory (Swann 1983) indicates that people are motivated to verify, validate, and sustain their existing self-concepts They search for experiences that affirm their sense of self and avoid those experiences that threaten their sense of self (the self-verification motive, see Swann 1983, Swann, Stein-Seroussi, and Giesler 1992) Self-verification leads to positive self-evaluations and positive evaluations of others that facilitate attachment to others (Burke and Stets 1999) In addition, the self-verification motive leads people to behave in ways consistent with how they see themselves (i e , their actual self, Lecky 1945) One way to accomplish this is to consume a brand with a personality that is congruent with the actual self, which results in positive reinforcement for the consumer and leads to positive feelings about the brand and greater emotional brand attachment

H_1 Actual self-congruence has a positive effect on emotional brand attachment

In terms of ideal self-congruence, self-enhancement has been identified as people's underlying tendency to seek information that increases their self-esteem (Ditto and Lopez 1992) Self-enhancement theory assumes that people are motivated to increase their feelings of personal worth (the self-enhancement motive, Sedikides and Strube 1997) This motive drives people to approach their aspirations (i e , their ideal self) to enhance their self-esteem (Higgins 1987) A brand with a personality that reflects consumers' ideal selves can support them in their self-enhancement activities by giving them the feeling of getting closer to their ideal self (Grubb and Grathwohl 1967) Thus, if the consumer sees his or her aspirations and dreams embodied in a brand (i e , ideal self-congruence), he or she will be attracted to that brand (see also Boldero and Francis 2002) and become emotionally attached to it

> H_2 Ideal self-congruence has a positive effect on emotional brand attachment

Relative Effect of Actual and Ideal Self-Congruence on Emotional Brand Attachment

If H_1 and H_2 both hold and the actual and ideal self-congruence both have potential positive effects on the consumer's emotional brand attachment, the next logical question is whether actual or ideal self-congruence is more important for the consumer's emotional brand attachment

To develop this next hypothesis, we draw on construal-level theory (Liberman and Trope 1998) Construal-level theory suggests that the greater a person's psychological distance from an object (e g , a brand) or event (temporal, spatial, hypothetical, or social distance, Liberman, Trope, and Stephan 2007), the greater is the likelihood that he or she will mentally conceptualize this object or event in an abstract way (a so-called high-level construal) rather than in a concrete way (a low-level construal) When an object is further removed from a person's reality (i e , psychologically distant), he or she tends to have less available and reliable information about it, which leads to the formation of a more abstract and schematic representation of the object In contrast, when an event occurs in the "here and now" (a low-level construal), an individual tends to have a lot of information about it (he or she is, after all, currently experiencing it) and therefore thinks of it in concrete terms that make use of all the rich and contextualized detail available (Trope, Liberman, and Wakslak 2007)

Construal-level theory has generated significant research in consumer behavior, including studies on brand extensions (Kim and John 2008) It may also play a role in the relative importance of actual versus ideal self-congruence for emotional brand attachment Specifically, the actual and ideal selves are associated with certain levels of psychological distance, which then affect the construal level and the degree of emotional brand attachment

In general, consumers perceive their actual self as something psychologically close (i e , lower psychological distance) and their ideal self as something psychologically more distant Several arguments support this view (see Liberman, Trope, and Stephan 2007) First, psychologically distant things are those not present in an individual's direct experience of reality They may be thought of or constructed, but they cannot be experienced directly Second, an ideal self-view refers to something that takes place further into the future (versus the actual, which is viewed in the here and now) Third, the ideal self is shaped by imagination of ideals and goals related to what an individual believes he or she would like to be (Wylie 1979), and thus is hypothetical (further away from reality) and less likely to occur than a consumer's actual self Because one does not know the precise way a distant (ideal) self will manifest itself, this improbable event seems more distant than a probable event and therefore has greater psychological distance (Trope, Liberman, and Wakslak 2007) In other words, the actual self is more probable (psychologically closer), whereas the ideal self is something desirable (psychologically more distant) Furthermore, the regulatory focus literature suggests that promotion goals (e g , ideal self-congruence) are perceived as more temporally removed (i e , psychologically distant) from the present than prevention goals (Pennington and Roese 2003)

The psychological distance associated with the ideal or actual self can then be transferred to the underlying self-congruent brand If a consumer perceives a certain level of congruence between the ideal self and the brand, this brand is psychologically more distant than a brand that the consumer perceives to be congruent with his or her actual self Hence, the brand is psychologically closer in the case of actual self-congruence As a consequence, the consumer will mentally construe an actual self-congruent brand on a lower construal level (i e , concretely with many details) When a brand's personality is close to a consumer's ideal self, it is linked with an abstract and high-level mental construal These differing psychological distances and construal levels have an impact on the consumer's emotional brand attachment because psychological distance and affect are inextricably linked Empirically, it has been shown that distance reduces the affective intensity of stimuli, and distant future events (i e , abstract and high-level construals) are rated lower in experienced affect than near future events (i e , concrete and low-level construals) (Williams and Bargh 2008) On the basis of these considerations, we hypothesize the following

> H_3 Actual self-congruence has a stronger effect on emotional brand attachment than ideal self-congruence

Moderating Effects

It is important to note that the hypothesized effects in H_1 through H_3 may not be equally pronounced for all people In other words, these effects may be stronger for those with certain characteristics or predispositions Thus, we further explore three key variables that might moderate the relationship between self-congruence and emotional brand attachment

Our first hypothesized moderator of the relationship between self-congruence and emotional brand attachment is product involvement As we outlined in the context of H_1, actual self-congruence increases emotional brand attachment because it supports a consumer in his or her aim for self-verification According to research in psychology, self-verification requires substantial cognitive effort and is more likely to occur when people are motivated to process deeply (Swann et al 1990) Thus, consumers with high product involvement will be more motivated to invest the cognitive effort required for self-verification (Petty and Cacioppo 1986)

Furthermore, motivation for self-verification tends to be more important among consumers with high product involvement For example, in the context of interpersonal relationships, Hixon and Swann (1993) find that people tend to prefer self-verifying partners when they perceive the consequences of choosing an interaction partner to be important Choosing self-verifying partners requires a certain amount of self-reflection and thus more cognitive effort because the person must access his or her own self for a comparison process (Hixon and Swann 1993) Because previous research has indicated that brand relationships often take on the characteristics of interpersonal relationships (Fournier 1998), consumers will be more likely to prefer self-verifying brands (i e , with a high actual self-congruence) when involvement is high In addition, the increased cognitive effort leads to a greater incorporation of the brand into the consumer's self-concept As we mentioned previously, when this occurs the consumer feels a greater personal connection between the self and the brand, resulting in a stronger emotional brand attachment

When involvement is low, consumers may not be willing to process deeply and therefore do not engage in the cognitive elaboration required to engage in self-verification In this case, the product is not important enough for consumers to invest the effort of choosing the brand as a self-verifying brand relationship partner As a result, these consumers are less likely to make the connection between the brand and their actual self and therefore are less likely to form an emotional brand attachment, which leads to the following hypothesis

> H_{4a} Product involvement strengthens the relationship between actual self-congruence and emotional brand attachment

Alternatively, in the case of ideal self-congruence, we argue that the impact on emotional brand attachment is weakened by the consumer's product involvement As we discussed in the context of H_2, the self-enhancement process that results from the consumption of ideally self-congruent brands increases the consumer's emotional brand attachment

Our first line of reasoning is based on interpersonal relationship theory According to research in this area, self-enhancement is more likely to occur when cognitive capacity is limited (Swann et al 1990), which is the case when product involvement is low (Petty and Cacioppo 1986) In other words, people tend to like self-enhancing interaction partners when there is little self-reflection (i e , when the selection of the interaction partner does not have important consequences, Hixon and Swann 1993) This occurs because the choice of a self-enhancing interaction partner is much easier to make (in comparison to a self-verifying partner) In other words, because the person does not have to access his or her own self for a comparison process, the positive image of the interaction partner is used as an indicator for potential self-enhancement Translating this to a branding context, consumers with low product involvement should prefer self-enhancing brands (i e , with a high ideal self-congruence) because they can use the brand's positive image for self-enhancement without elaborating in detail about their own ideal self

In addition, these effects are consistent with the self-evaluation–maintenance model of Tesser (1988), which examines the processes through which people can maintain positive self-evaluations when facing potentially threatening comparisons with others When relevance is high, consumers are more likely to engage in an upward comparison process and relate themselves to ideal others When this occurs, the better performance of the ideal person is a threat to self-evaluation and can cause negative emotions In this case, a person will put distance between him- or herself and the ideal other In the present context, the image of the ideal brand could be threatening to highly involved consumers and cause negative emotions as well, which makes consumers aware that they have not achieved their ideal

However, when relevance is low, people are less likely to engage in a detailed comparison process, rather, a heuristic reflection process is more likely to be used, in which the self is assimilated with the other and the person can "bask in the reflected glory" of the other's successes (Cialdini et al 1976, p 366) The same process can occur in a branding context According to MacInnis and De Mello (2005), brands or products that envision ideals can be sources of hope and promote status, desires, symbolic self-completion, and enhanced self-esteem When involvement is low, consumers can simply experience the positive emotions (such as hope) associated with the brand, thereby increasing their emotional brand attachment These arguments lead us to the following hypothesis

> H_{4b} Product involvement weakens the relationship between ideal self-congruence and emotional brand attachment

Our second hypothesized moderator of the relationship between self-congruence and emotional brand attachment is self-esteem Work in psychology indicates that all people strive to maintain a positive self-concept (Brown, Collins, and Schmidt 1988) Self-esteem is considered one of the strongest psychogenic needs, and people are strongly driven to feel good about themselves People high in self-esteem evaluate their actual self as positive (i e , positive self-conceptions, Kernis 2003) and seek to confirm their actual self-views On the basis of these self-verification processes, they will feel closer to a brand that reflects their actual self Thus, self-verification leads to more positive feelings toward the underlying brand People with low self-esteem perceive their actual self as more negative, and they are less likely to make an emotional connection with brands that come close to their actual self, because linking a brand to a self that is perceived as negative generates negative feelings Thus, we hypothesize the following

> H_{5a} Self-esteem strengthens the relationship between actual self-congruence with a brand and emotional brand attachment

In the case of ideal self-congruence, self-enhancement strategies become central In particular, people with low self-esteem are more likely to have a gap between their actual and ideal selves (Higgins 1987) Self-enhancement is a way to reduce this discrepancy (e g , Markus and Wurf 1987) According to self-discrepancy theory (Higgins 1987), reducing the discrepancy between actual and ideal selves (i e , getting closer to the ideal self) can generate positive emotions toward the cause of such a self-enhancement In other words, connecting with brands that embody an ideal personality is a self-enhancing strategy for consumers who are dissatisfied with their actual self (i e , low self-esteem) This strategy makes consumers feel that they get closer to their ideal self, which bolsters their self-confidence and leads to positive emotions toward the underlying brand For example, Solomon (1983) provides the example of adolescent boys' use of "macho" products such as cars, clothing, and cologne to bolster their fragile masculine self-concepts Thus, a brand that is similar to a person's ideal self may be used to bolster his or her self-confidence (which is emotionally pleasing), which in turn can increase the emotional attachment to that brand

People with high self-esteem rarely attempt to bolster their feelings of worth because their actual–ideal self-discrepancy tends to be low (Higgins 1987) As a consequence, they are less likely to engage in self-enhancement strategies and therefore do not experience the positive emotions that result from such a symbolic self-improvement Thus, they are less likely to develop a strong emotional attachment with self-enhancing brands

H_{5b} Self-esteem weakens the relationship between ideal self-congruence and emotional brand attachment

Our third hypothesized moderator of the relationship between self-congruence and emotional brand attachment is public self-consciousness (the awareness of the self as a social object) People with high public self-consciousness are more concerned about the impression they make and continuously think about how they present themselves to others (Carver and Scheier 1987, Fenigstein 1987) Therefore, they should be more aware that others can judge them on the basis of their consumption of brands In line with this argument, Bushman (1993) finds that publicly self-conscious people have a preference for national brand labels versus bargain brand labels because these brands are important means of self-expression In the current context, consumers with high public self-consciousness should be more aware that by consuming a self-congruent brand, they will express to others who they really are (actual self-congruence) or who they would like to be (ideal self-congruence, Markus and Wurf 1987)

In terms of actual self-congruence, by consuming a brand that is congruent with the actual self, consumers can express their actual (true) self to others Self-expression is often a key motive for the consumption of a brand, and satisfying this need is emotionally pleasing (Fournier 1998) In doing so, consumers are true to themselves (i e , authentic) and do not communicate something to others that they are not Thus, they achieve a balance between their true inner view and the public perception of themselves, which results in cognitive consonance Consonance creates a positive feeling (Festinger 1957) that can lead to higher emotional brand attachment Consumers with high public self-consciousness are more aware of this consonance because they care more about the impressions they make on others and thus better recognize the authentic self-expression potential through the consumption of an actually self-congruent brand Furthermore, publicly self-conscious consumers will appreciate authentic self-expression because they can feel more in control of the social interaction (Doherty and Schlenker 1991) By consuming an actually self-congruent brand, they create a public impression that generates expectations they feel they can meet (Baumeister, Hamilton, and Tice 1985), which leads to a closer emotional bond with the brand

Less publicly self-conscious consumers, however, are much less concerned about others' impressions and therefore care less about expressing themselves in an accurate way (Fenigstein 1987) They do not gain the same positive emotions that result from self-expression through brands that are congruent with the actual self Thus, we hypothesize the following

H_{6a} Public self-consciousness strengthens the relationship between actual self-congruence and emotional brand attachment

Highly publicly self-conscious people tend to be socially anxious when they are unable to live up to their positive self-presentations (Buss 1980) Thus, they have a desire to avoid disapproval, which motivates them to steer clear of self-presentational failures such as being unable to live up to their claims Applied to the current context, highly publicly self-conscious consumers may not feel comfortable with an ideally self-congruent brand because they fear that such a brand promises too much to others (i e , others' expectations become too high) In other words, these consumers may fear presenting themselves in an overly positive and unrealistic way, which could cause others to expect too much of them or to place extravagant demands on them (Baumeister, Hamilton, and Tice 1985) Consumers with high public self-consciousness are aware of the need to fulfill social expectations and worry about the negative public impression they make in the case of not meeting these expectations This perceived risk of reputational damage and the associated lack of control of public image can result in negative emotions toward the source of that risk the ideally self-congruent brand, which leads to a lower emotional attachment toward such a brand among consumers with high public self-consciousness

In contrast, consumers with low public self-consciousness care less about their public perception Consequently, they should be less concerned about the risk of overpromising and failing to meet these promises They also would take more risks and care less about their failure to live up to high expectations because they are less concerned with regard to their public impression on others (Tunnel 1984) Therefore, negative emotions toward the underlying brand evoked by risky self-exposure should not play an important role Thus, there are no negative emotions interfering with the positive emotions the consumer has because of the self-enhancement potential of an ideally self-congruent brand These positive emotions should then increase the consumer's emotional brand attachment

H_{6b} Public self-consciousness weakens the relationship between ideal self-congruence and emotional brand attachment

Method

Data Collection and Sample

To test our hypotheses empirically, we conducted two large-scale studies In Study 1, we addressed the hypotheses involving the general and relative impact of actual and ideal self-congruence on emotional brand attachment (H_1–H_3) and explored the effect of product involvement as the moderating variable (H_{4a} and H_{4b}) The goal of Study 2 was to validate the results from the first study involving our basic model (H_1–H_3) and to explore the impact of two additional moderating variables (self-esteem and public self-consciousness H_{5a}–H_{6b})

We followed the same procedure in both studies E-mail invitations to participate in a survey were sent to 11,093 consumers (6943 in Study 1 and 4150 in Study 2) These consumers included people from the student body of a Swiss university's departments of business administration, economics, law, and medicine, high school students, employees of governmental institutions and individual companies, and members of consumer protection associations in Switzerland In the e-mail, we provided a direct link to a specific section of a web page that was accessible only through the link provided in the e-mail As an incentive to participate in our study, we entered respondents' names in a lottery for more than $4,500 in prizes, including helicopter flights over the Swiss Alps, ski holidays, iPods, iPads, and marketing textbooks

Respondents followed a link to an online questionnaire that randomly assigned them to a brand Each respondent answered the questions for only one brand and first reported his or her familiarity with that brand on the three-item brand familiarity scale of Kent and Allen (1994, "I feel very familiar with brand x," "I feel very experienced with brand x," and "I know the product[s] of brand x") Only if the respondent reported an overall brand familiarity of at least 3 5 (5 = "maximum familiarity," and 1 = "no familiarity") was that person allowed to continue with the corresponding brand If the brand familiarity was below 3 5, a new brand was randomly assigned This interactive assignment of a brand to the consumer was a key reason that we used an online questionnaire

This procedure resulted in 1329 (Study 1) and 890 (Study 2) responses, for overall response rates of 19 1% (Study 1) and 21 4% (Study 2) The two samples included consumers from a variety of backgrounds (Study 1 68 8% students, 22 1% employees, 9 1% others, 54 9% female, 45 1% male, and average age of 24 5 years, Study 2 60 3% students, 36 6% employees, 3 1% others, 55 8% female, 44 2% male, and average age of 26 8 years)

We tested the extent to which the students' answers were comparable to the other respondents and conducted mean difference tests for all focal constructs We found no significant differences with regard to all constructs of our research framework between the answers of students versus nonstudents Thus, pooling together the groups of respondents seemed appropriate In addition, multiple group analyses revealed that the effects of actual and ideal self-congruence on emotional brand attachment do not significantly differ between the two groups of respondents (i e , the chi-square differences with Δd f = 1 are not significant, Study 1 $\Delta\chi^2_{ASC} = 1\ 22$, $\Delta\chi^2_{ISC} = \ 01$, Study 2 $\Delta\chi^2_{ASC} = 2\ 05$, $\Delta\chi^2_{ISC} = \ 93$)

Our unit of analysis was the individual brand relationship between a consumer and a specific familiar brand We studied 167 brands, covering several industries, including fast-moving consumer goods (Study 1 = 41 8%, Study 2 = 40 9%), durable consumer goods (Study 1 = 15 9%, Study 2 = 17 8%), services (Study 1 = 26 0%, Study 2 = 22 6%), and retailing (Study 1 = 16 3%, Study 2 = 18 8%) The brands were chosen from among different Interbrand rankings (the 50 most valuable Swiss brands in 2006 and 2007 and the best global brands in 2006 and 2007) and therefore had a high probability of being familiar to the respondents

In each study, we sent all initial e-mails on the same day and recorded the specific dates of responses of the individual consumers This record enabled us to distinguish between early and late respondents The tests showed no significant differences between the responses from these two groups on all our major constructs and on key demographic variables, which suggests that nonresponse bias is not a problem in our data (Armstrong and Overton 1977)

Measures

We based the items used for our measurement scales on empirically validated scales from previous studies We measured the questionnaire's constructs with five-point Likert scales anchored by "strongly disagree" and "strongly agree " We pretested our questionnaire and further refined it on the basis of the comments of 50 business administration graduate students

We assessed the independent variable of actual self-congruence by using the scale of Sirgy et al (1997) and adapted it for assessing ideal self-congruence Assuming that self-congruence is a holistic, gestalt-like perception, Sirgy et al (1997) show that a method that taps the psychological experience of self-congruence directly is more predictive of different consumer behaviors (e g , brand preference and brand attitude) than traditional measures (e g , mathematical discrepancy indexes) This global measure is operationalized using a two-step approach in which respondents take their time to think about and elaborate on the brand's personality, think about their actual and ideal selves, and then indicate the extent of self-congruence in a global manner Specifically, respondents were instructed to take a moment to think about brand x as if it were a person and to think of the set of human characteristics associated with that brand Next, respondents were asked to think about how they see themselves and how they would describe their own personality (actual self) After respondents completed this, they indicated their global perception of the degree of match or mismatch between how they see the brand's personality and how they see themselves (for the instructions and the specific items, see Appendix A) The same procedure was used for ideal self-congruence

In terms of the dependent variable, we assessed emotional brand attachment using six items adapted from measures previously used in consumer research (Thomson, MacInnis, and Park 2005) As Thomson, MacInnis, and Park (2005) propose, we loaded these items on three second-order factors (i e , affection, connection, and passion) To keep the number of parameters in our model at a manageable level while preserving the multifaceted nature of the construct, we followed Little et al 's (2002) suggestions and used item parcels to measure the consumers' emotional brand attachment in our structural model More specifically, for each of the three facets of emotional brand attachment (i e , affection, connection, and passion), we averaged the values on the respective scales and then used these three average values as indicators for the higher-level construct of emotional brand attachment

Finally, we measured the moderating variable product involvement with two items from Van Trijp, Hoyer, and Inman (1996) and added three items that reflect the personal importance based on values and attitudes (e g , "Because of my personal values, I feel that this a product that ought to be important for me") to ensure that our measure mirrored our conceptual definition of this construct We instructed the participants to indicate to what extent the given statements apply to the product associated with the brand x (which was interactively provided to them) and provided them guidance over what a product is "Product" refers to the product that is connected to the brand (e g , product "car" for the brand "Audi") For the assessment of consumers' self-esteem, we used all ten items from the widely used Rosenberg Self-Esteem Scale (Rosenberg 1965) We measured public self-consciousness with Fenigstein, Scheier, and Buss's (1975) seven-item scale In the course of our measurement validation, four items remained for the Rosenberg Self-Esteem Scale, and four items remained for the Public Self-Consciousness Scale

Appendix A provides a complete list of our measures and their psychometric properties, and Table 1 presents the correlations of the framework variables Overall, our measurement scales show sufficient reliability and validity More specifically, for all constructs, the composite reliability exceeds the threshold value of 6 (Bagozzi and Yi 1988) All coefficient alpha values exceed the threshold value of 7 recommended by Nunnally (1978), except the actual self-congruence measure in Study 1 (69) All the factor loadings are significant ($p <$ 01), which Bagozzi, Yi, and Phillips (1991) suggest as a criterion of convergent validity Furthermore, with few exceptions, item reliabilities are above the recommended value of 4 (Bagozzi and Baumgartner 1994) We assessed the discriminant validity of the construct measures on the basis of the Fornell and Larcker's (1981) criterion, which indicates that discriminant validity is supported if the average variance extracted exceeds the squared correlations between all pairs of constructs All constructs fulfilled this requirement, which suggests that the degree of discriminant validity for all our constructs is sufficient

To test for potential common method bias, we used a confirmatory factor analysis approach to Harman's one-factor test (e g , Podsakoff et al 2003) and assessed whether a single latent factor would account for all the manifest variables of our basic model In this test, a single-factor model in which all manifest variables are explained through one common method factor was compared through a chi-square difference test to our multifactor measurement model In Study 1, the chi-square value of the single-factor model was 1513 87 (d f = 14), which was significantly worse compared with our basic measurement model with the three factors actual self-congruence, ideal self-congruence, and emotional brand attachment $\Delta\chi^2 = 1427$ 92, Δd f = 3, $p \leq$ 01 Also in Study 2, the chi-square difference between the single-factor and the three-factor model was significant ($\Delta\chi^2 = 887$ 58, Δd f = 3, $p \leq$ 01), which provides preliminary evidence that the measurement model of both studies is robust to common method variance

Results

We used AMOS 17 0 to model the structural relationships posited by our conceptual framework (see Figure 1) Actual self-congruence and ideal self-congruence were allowed to correlate in our structural equation model In both studies, the measures of overall fit mostly meet conventional standards, which suggests that our model fits the data well (Study 1 χ^2/d f = 7 814, root mean square error of approximation [RMSEA] = 072, standardized root mean square residualion [SRMR] = 036, normed fit index [NFI] = 984, nonnormed fit index [NNFI] = 973, and comparative fit index [CFI] = 986, Study 2 χ^2/d f = 4 386, RMSEA = 062, SRMR = 019, NFI = 989, NNFI = 983, and CFI = 991)

In Table 2, we report the parameter estimates of our basic model In both studies, the results confirm a strong positive relationship between actual self-congruence and emotional brand attachment (Study 1 $\gamma =$ 55, $p \leq$ 01, Study 2 $\gamma =$ 57, $p \leq$ 01), which supports H_1 Ideal self-congruence, however, did not have a significant effect on emotional brand attachment (Study 1 $\gamma =$ 02, not significant [n s],

TABLE 1
Correlations of Framework Variables

		1	2	3	4	5
1 Actual self-congruence	Study 1					
	Study 2					
2 Ideal self-congruence	Study 1	62**				
	Study 2	75**				
3 Emotional brand attachment	Study 1	47**	41**			
	Study 2	53**	49**			
4 Product involvement	Study 1	39**	30**	42**		
	Study 2	—[a]	—[a]	—[a]		
5 Self-esteem	Study 1	—[a]	—[a]	—[a]		
	Study 2	- 06	- 14**	- 06		
6 Public self-consciousness	Study 1	—[a]	—[a]	—[a]	—[a]	—[a]
	Study 2	11**	08*	10**	—[a]	14**

*$p \leq$ 05
**$p \leq$ 01
[a] Not included in the respective study

TABLE 2
Results of Hypotheses Testing

		Perceived Actual Self-Congruence → Emotional Brand Attachment Standardized Estimate (t-Value)	Δχ2	Perceived Ideal Self-Congruence → Emotional Brand Attachment Standardized Estimate (t-Value)	Δχ2
Basic Model	Study 1	547** (8 093)		018 (297)	
	Study 2	565** (6 762)		074 (960)	
Basic Model in Different Industries					
Fast-moving consumer goods	Study 1	527** (5 796)		023 (276)	
	Study 2	656** (5 188)		– 057 (634)	
Durable consumer goods	Study 1	594** (4 292)		012 (104)	
	Study 2	372* (1 990)		321 (1 814)	
Services	Study 1	632** (2 770)		– 104 (– 493)	
	Study 2	582** (3 731)		092 (621)	
Retail	Study 1	361* (2 274)		222 (1 499)	
	Study 2	540** (3 064)		097 (579)	
Moderated Models					
Product involvement	Low	230** (3 229)	5 617*	197** (2 914)	5 751*
	High	589** (5 759)		– 067 (– 743)	
Self-esteem	Low	412** (4 022)	4 345*	260** (2 718)	7 487**
	High	778** (5 560)		– 173 (–1 346)	
Public self-consciousness	Low	447** (4 298)	3 963*	207* (2 135)	5 817*
	High	889** (4 648)		– 244 (–1 410)	

*$p \leq$ 05
**$p \leq$ 01

Study 2 $\gamma =$ 07, n s) Therefore, H_2 is not supported The values of these two path coefficients provide support for our hypothesis regarding the relative impact of actual and ideal self-congruence on emotional brand attachment (H_3) Actual self-congruence has a stronger impact on emotional brand attachment than does ideal self-congruence The corresponding differences are 53 (Study 1) and 50 (Study 2) On the basis of a chi-square difference test, in which we compared an unconstrained model with a constrained model (i e , the two path coefficients of actual and ideal self-congruence were constrained to be equal), this difference is highly significant (Study 1 $\Delta\chi^2 = 33\ 89, \Delta d\ f\ = 1, p \leq\ 01$, Study 2 $\Delta\chi^2 = 12\ 25, \Delta d\ f\ = 1, p \leq\ 01$) Thus, in support of H_3, actual self-congruence has a significantly stronger effect on emotional brand attachment than does ideal self-congruence

To check the validity of our hypothesized model across different product categories (i e , fast-moving consumer goods, durable consumer goods, services, and retail), we conducted multiple-group analysis and ran the main model separately for the different subgroups The results were stable across categories In all four categories, actual self-congruence has a significant effect on emotional brand attachment, whereas ideal self-congruence does not (for the results, see Table 2) Furthermore, a test of invariance regarding the structural coefficients revealed that the null hypothesis (i e , that there are no differences regarding the coefficients) cannot be rejected The constrained model with the same parameter estimates across all four categories does not have a significantly worse model fit than the unconstrained model (Study 1 $\Delta\chi^2 = 4\ 756, \Delta d\ f\ = 6$, n s , Study 2 $\Delta\chi^2 = 5\ 972, \Delta d\ f\ = 6$, n s) Thus, pooling the different categories was appropriate

We used multiple group structural equation modeling to test H_4–H_6, which refer to the moderating role of product involvement, self-esteem, and public self-consciousness on the relationship between self-congruence and emotional brand attachment First, we performed a median split along the values of the moderator variables to create two subsamples for each moderator, one with low values of the moderator (e g , consumers with a low level of product involvement) and the other with high values (e g , consumers with high levels of product involvement) We then analyzed the basic model implied by our theoretical framework simultaneously in both subsamples using AMOS 17 0 Table 2 shows the parameter estimates for the different subgroups

Regarding our first moderator variable, product involvement, the results confirmed a positive moderating effect of product involvement on the relationship between actual self-congruence and emotional brand attachment Although actual self-congruence has a positive effect on emotional brand attachment among low-involvement consumers ($\gamma =\ 23, p \leq\ 01$), this effect becomes even stronger among consumers with a high level of product involvement ($\gamma =\ 59, p \leq\ 01$) To statistically test the significance of this moderating effect, we again relied on a chi-square difference test In support of H_{4a}, the chi-square difference with $\Delta d\ f\ = 1$ is significant at the 05 level ($\Delta\chi^2_{ASC} = 5\ 62$) Ideal self-congruence, however, has a significant and positive effect on emotional brand attachment only among consumers with a low level of involvement ($\gamma =\ 20, p \leq\ 01$) and no significant effect among high-involvement consumers ($\gamma = -.07$, n.s.). The chi-square difference again is significant ($\Delta\chi^2_{ISC} = 5.75$, $\Delta d.f. = 1$, $p \le .05$), in support of H_{4b}. To ensure that these observed effects of involvement are not caused by differences between product categories (which happen to also differ in involvement), we tested the interaction of involvement and self-congruence *within* each of the four product categories and found that the interaction had the expected sign in each of the product categories, though it only reached significance for fast-moving consumer goods (the category with the greatest sample size).

Self-esteem is our second moderating variable. Our results indicate a stronger impact of actual self-congruence on emotional brand attachment among consumers with a high level of self-esteem ($\gamma = .78$, $p \le .01$) compared with consumers with low self-esteem ($\gamma = .41$, $p \le .01$, $\Delta\chi^2_{ASC} = 4.35$, $\Delta d.f. = 1$, $p \le .05$), in support of H_{5a}. The effect of ideal self-congruence on emotional brand attachment becomes significant and positive among consumers with low self-esteem ($\gamma = .26$, $p \le .01$) but has no significant impact in the condition of high self-esteem ($\gamma = -.17$, n.s.). Here, the chi-square difference is highly significant ($\Delta\chi^2_{ISC} = 7.49$, $\Delta d.f. = 1$, $p \le .01$), in support of H_{5b}.

Our third moderator is the consumer's public self-consciousness. In support of H_{6a}, actual self-congruence has a weaker positive effect on emotional brand attachment among consumers with low public self-consciousness ($\gamma = .45$, $p \le .01$) compared with consumers with a high level of public self-consciousness ($\gamma = .89$, $p \le .01$, $\Delta\chi^2_{ASC} = 3.96$, $\Delta d.f. = 1$, $p \le .05$). Ideal self-congruence, however, has a significant and positive effect on emotional brand attachment only among consumers with low public self-consciousness ($\gamma = .21$, $p \le .05$). This relationship is not significant among consumers high in public self-consciousness ($\gamma = -.24$, n.s.). In support of H_{6b}, the negative moderating effect of public self-consciousness is significant ($\Delta\chi^2_{ISC} = 5.82$, $\Delta d.f. = 1$, $p \le .05$).

In addition, we tested the moderation of the relative effect of actual versus ideal self-congruence on emotional brand attachment (H_3) by our three moderators. Using multiple-group structural equation modeling (for a detailed description of the tests performed, see Appendix B), we found that all three moderators (product involvement, self-esteem, and public self-consciousness) can significantly increase the relative importance of actual self-congruence as a driver of emotional brand attachment (i.e., compared with ideal self-congruence). However, the relatively stronger effect of actual self-congruence on emotional brand attachment becomes reliably less pronounced when product involvement, self-esteem, or public self-consciousness is low.

Discussion

The primary focus of our research was to develop a better understanding of when marketers should emphasize a brand personality related to aspirations (i.e., tailored to the consumers' ideal self) or the real (actual) consumer self to increase emotional brand attachment. Our findings support the view that self-congruence can increase emotional brand attachment, however, both the type of self-congruence and the context/consumer characteristics must be considered. In general, brands with actual self-congruence generated higher levels of emotional brand attachment. This effect was even more pronounced when consumers were involved with the product (Study 1) or had a high level of self-esteem or public self-consciousness (Study 2). Surprisingly, and in contrast to the commonly observed managerial practice of aspirational branding, across our two studies, brands with ideal self-congruence in general were less successful in increasing emotional brand attachment. However, we found that aspirational branding may still work under certain conditions, specifically when involvement, self-esteem, or public self-consciousness is low.

Academic Implications and Further Research

The first important academic contribution is to provide knowledge regarding the issue of whether to focus on the actual or ideal self in generating emotional brand attachment. Our observation across two studies suggests that consumers are more likely to form a strong emotional connection with a brand that validates who they are right now than with a brand that promises them help achieving an ideal self. This is an important finding because it can be linked to the concept of authenticity in the psychology literature (e.g., Erickson 1995) and consumer research literature (e.g., Beverland and Farrelly 2010). A person's authenticity is reaffirmed when he or she acts in ways that reflect the "real me" or "my true self" and is discouraged when acting in ways that they feel are phony or artificial (Harter 2002). An authentic relationship involves presenting one's "genuine" self to someone else in a way that creates strong emotions and bonds based on intimacy and trust (Erickson 1995; Harter 2002). Thus, our research provides a possible explanation for the success of an authentic approach to branding, which recently has been gaining importance in academia and business practice.

Furthermore, our empirical findings for H_3 support construal-level theory arguments, demonstrating the potential relevance of this theory in developing a better understanding of branding phenomena. For example, the construal level may have an impact on consumers' evaluations of emotional branding activities (Thompson, Rindfleisch, and Arsel 2006) and collaborative branding (when the company actively engages the consumer in branding activities, for example, through brand communities; Schau, Muñiz, and Arnould 2009). Such activities might bring the brand psychologically closer to the consumer and result in a more concrete (high-level), brand-related mind-set, thereby leading to a different consumer response compared with low-level construals. In other words, construal level can be a theoretical explanation for why certain branding strategies and activities work or do not work. Thus, a brand information–processing perspective based on construal-level theory should be a promising avenue for future brand management research.

Although we expected a positive overall effect of ideal self-congruence on emotional brand attachment, the results of both studies revealed otherwise (i.e., no significant effects were found). This finding might be explained by the coexistence of both positive and negative effects of ideal self-congruence on emotional brand attachment On the positive side, self-enhancement activities can lead to a positive relationship between ideal self-congruence and emotional brand attachment (Sirgy 1982), though this seems to occur mainly for consumers with low levels of self-esteem, product involvement, or public self-consciousness Some consumers, however, may negatively perceive any gap between their own reality and a brand with an idealistic brand personality that personifies their dreams and aspirations (e g , fashion brands that personify perfect beauty and richness, Richins 1991) Social comparison theory (Festinger 1954) supports the notion that such an experience can be an emotional process Making a social comparison between the self and others (e g , attractive models in advertising, Gulas and McKeage 2000) may lead to negative feelings (Gilbert, Giesler, and Morris 1995) such as inferiority, jealousy, or envy, which can occur especially when the consumer believes that the other person is "out of reach" or too superior (upward social comparison) Such emotions can be painful and even devastating for the consumer, such that he or she wants to distance himself or herself from the other (superior) person (Collins 1996) Transferred to a branding context, when the brand represents something that is out of reach, this need for distancing could result in a decreased emotional brand attachment

Another important academic contribution focuses on our moderating variables We add to existing knowledge on emotional brand attachment by examining several conditions under which actual or ideal self-congruence can create strong attachment Taking a contingency perspective on self-congruence, we show that the impact of a self-congruent brand personality depends on the type of self-congruence and on individual consumer-related variables and characteristics Thus, our findings support the view that self-congruence needs a more fine-grained perspective that distinguishes between different types of self-congruence (Sirgy 1982) They also contribute to the literature that calls for a more targeted approach to branding by directly addressing consumer-specific differences in the definition and implementation of branding strategies (e g , Lambert-Pandraud and Laurent 2010)

Our results indicate that product involvement is an important moderator of the relationship between self-congruence and emotional brand attachment When involvement is high, the brand is more personally relevant, and the consumer will elaborate on the connections between the brand and his or her actual self If these comparisons are congruent, the consumer's actual self is verified, and the consumer feels a stronger connection with the brand, leading to stronger emotional brand attachment However, when involvement is low, consumers are less willing to engage in self-verification through the brand because the underlying product is not important enough However, they seem to be willing to emotionally connect with self-enhancing (i e , ideally self-congruent) brands By examining the moderating effect of product involvement, we gained a better understanding of why focusing on the actual self works better in some situations, whereas a focus on the ideal self works in others

The second moderating variable was self-esteem Our results are consistent with the notion that consumers with high self-esteem are attracted to a brand that is congruent with their actual self because of a self-verification process, which helps consumers feel good about themselves and builds stronger brand connections Consumers with low self-esteem, however, would find brands related to the ideal self more attractive because these brands represent an opportunity to make them feel better about themselves by association (i e , self-enhancement) In contrast, brands congruent with the actual self are perceived negatively when consumers do not feel good about their current selves Again, these findings add to the knowledge on reasons that actual and ideal self-congruence work in different situations

Public self-consciousness is the final moderating variable Our results indicate that when public self-consciousness is high, actual self-congruence produces stronger emotional brand attachment Again, this finding illustrates the importance of the authentic self-expression motive in relation to brand personality When public self-consciousness is high, consumers form attachments with brands that allow them to express who they really are In contrast, ideally self-congruent brands lead to a stronger emotional brand attachment only with consumers who have a low level of public self-consciousness An academic implication of this finding is that in addition to the congruence between the brand and self, the social context plays a key role in the development of emotional attachment to a brand as well

Although our study identifies three important moderating variables, further research might consider other moderating effects, particularly product-related context variables For example, the hedonic versus utilitarian nature of the product could be examined In particular, the effects of self-congruence may be more important for hedonic and symbolic products and not as important for utilitarian products in which other functions play a role (e g , technical aspects) In addition, whether the product is consumed in public or private may also be relevant With regard to the type of self-congruence, future studies might link self-congruence to self-regulation theory (e g , Higgins 2002), which distinguishes between ideal self-guides and "ought" self-guides and their different mechanisms For example, the ought self-guides may play a prominent role in the context of publicly consumed goods

In the current study, we examine an "overall" self-congruence Further research could also address differences in a brand's personality dimensions For example, self-congruence with regard to the personality dimensions of sincerity, excitement, and competence could have a different effect on branding outcomes compared with self-congruence on sophistication and ruggedness In addition, further research might consider the salience of consumers' actual–ideal self-discrepancies in relation to the attainability of consumers' ideal selves (i e , whether consumers believe their ideal self is likely to be realized, e g , Rosenberg 1979) Because we did not measure this gap directly, its salience, or the perceived achievability of the consumer's ideal self, further research is needed to examine these important phenomena and their attendant emotions

A limitation of the current studies is that only outcome measures of actual and ideal self-congruence are examined. No evidence is provided regarding the exact nature of the process that consumers use to make these kinds of comparisons or judgments. Therefore, future studies that use more detailed process measures are needed. Important questions would include the following: How do self-enhancement processes work? And how do consumers counterbalance positive and negative emotional effects related to ideal self-congruence?

Managerial Implications

Our results have important implications for marketing managers as well. First, marketers are increasingly interested in finding ways to develop strong emotional brand attachments among their consumers, which can lead to stronger brand loyalty and brand performance (Park et al. 2010). Our findings indicate that there are four important issues for managers to consider when trying to increase consumers' emotional brand attachment: (1) incorporating consumers' selves into branding considerations, (2) focusing on authentic branding, (3) reconsidering aspirational branding, and (4) individualizing their branding efforts.

Our studies show that to emotionally connect consumers to their brands, marketing managers should adopt a customer-oriented perspective in defining brand personality that takes the selves of their targeted customers into consideration. In brand management practice, the importance of such an external approach is often underestimated. Many marketing managers focus more on an internal consistency of their intended brand personality by aligning it with corporate strategy, corporate culture, and brand tradition (e.g., Simões, Dibb, and Fisk 2005). Adopting an external approach could enable customers to feel a greater similarity between the brand and themselves, which our findings suggest is a key driver of emotional brand attachment.

Second, our results suggest that on a general level, the actual self is more important for consumers' emotional brand attachment. Thus, in building a brand personality, the more effective strategy seems to focus on actual self-congruence with the brand rather than ideal self-congruence when trying to increase emotional brand attachment. Thus, as mentioned previously, our results provide support for the superiority of "authentic branding" (i.e., targeting the brand personality toward the customer's actual self). This may be an explanation for why authentic branding continues to gain in importance in management practice (Beverland and Farrelly 2010; Gilmore and Pine 2007). In addition to the Dove example mentioned previously, several companies (e.g., Converse, IKEA, Nescafé, l'Occitane en Provence, Sprite) have used an authentic branding approach to generate a stronger emotional brand attachment among consumers. Our results indicate that this strategy is particularly effective if product involvement, self-esteem, or public self-consciousness is high.

Our third managerial implication is that aspirational branding strategies (i.e., branding strategies that aim at ideal self-congruence) may need to be reconsidered. Because we did not find an effect for ideal self-congruence on emotional brand attachment at a general level, the overall effectiveness of this approach must be questioned. One explanation for the nonexistence of a general positive effect of ideal self-congruence on emotional brand attachment is that the ideals that the brand envisions may not be attainable (i.e., they are perceived as being out of reach and, therefore, unreal or not authentic). Thus, it may be necessary to set realistic expectations in terms of brand promises. In other words, marketing managers should make sure that the brand does not set the ideal so high that consumers distance themselves from the brand and thus decrease their emotional brand attachment because of this lack of authenticity.

However, our findings show that there are still circumstances in which marketers could emphasize a brand personality related to aspirations. Low product involvement is such a circumstance. Here, consumers can "bask" in the reflected ideals that the brand possesses. Consumers will therefore experience only the positive emotions associated with the ideal self-depiction, thereby increasing their emotional brand attachment. Another circumstance in which aspirational branding may work is the case of consumers with low self-esteem. Here, a brand that comes close to the ideal self can help consumers to compensate their low self-esteem, get closer to their ideal self (i.e., to self-enhance), and increase their emotional attachment toward the brand. From a managerial point of view, this finding is important because it demonstrates that aspirational branding strategies can be implemented if done selectively. In communication activities associated with aspirational branding, marketers should emphasize the self-enhancement potential of the brand and its underlying product. The gap between actual and ideal selves and how the brand contributes to its reduction should be emphasized. Thus, our findings offer a conceptual explanation of why marketing activities that focus on the consumer's self-improvement (e.g., "before" and "after") may be effective in the context of aspirational branding. Aspirational branding can work with consumers who have a low public self-consciousness. One explanation may be that they are not concerned about the risks that self-expression through an ideally self-congruent brand might pose. A managerial recommendation could be to prime consumers for an increased awareness of themselves as individual people (and focusing less on social contexts). For example, corresponding communication activities could focus more on individual advertising spokespeople in private and intimate situations.

A fourth managerial implication refers to a call for more individual branding. This call is based on our finding that the effect of self-congruence on emotional brand attachment depends on the customer-specific context, which is consistent with the current trend in marketing of moving away from mass marketing to one-to-one marketing. Our results suggest that the one-to-one marketing approach should be applied to branding as well. New technologies in Web 2.0 allow individualized advertising based on consumer characteristics to be implemented. In addition, managers might develop innovative ways to combine the consumers' selves with their branding efforts. The trend toward collaborative branding (especially through social media), which enables marketing managers to give consumers the opportunity to contribute to a brand's personality, may be a good way to create a brand personality congruent with consumers' selves.

APPENDIX A

	Indicator Reliability		M (SD)		Cronbach's α		Spearman–Brown Split-Half Coefficient		Guttman Split-Half Coefficient		Composite Reliability		Average Variance Extracted	
Constructs and Items	**Study 1**	**Study 2**	**Study 1**	**Study 2**	**Study 1**	**Study 2**	**Study 1**	**Study 2**	**Study 1**	**Study 2**	**Study 1**	**Study 2**	**Study 1**	**Study 2**
Actual Self-Congruence Respondents were given the following instructions Take a moment to think about brand x Describe this person using personality characteristics such as reliable, smooth, etc Now think about how you see yourself (your actual self) What kind of person are you? How would you describe your personality? Once you've done this, indicate your agreement or disagreement to the following statements			2 30 (85)	2 11 (91)	69	82	69[a]	83[a]	69	82	71	83	55	70
1 The personality of brand x is consistent with how I see myself (my actual self)	40	73												
2 The personality of brand x is a mirror image of me (my actual self)	70	67												
Ideal Self-Congruence Respondents were given the following instructions Take a moment to think about brand x Describe this person using personality characteristics such as reliable, smooth, etc Now think about how you would like to see yourself (your ideal self) What kind of person would you like to be? Once you've done this, indicate your agreement or disagreement to the following statements			2 05 (1 00)	2 03 (1 02)	94	95	94[a]	95[a]	94	95	94	95	89	91
1 The personality of brand x is consistent with how I would like to be (my ideal self)	93	93												
2 The personality of brand x is a mirror image of the person I would like to be														

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APPENDIX A
Continued

Constructs and Items	Indicator Reliability		M (SD)		Cronbach's α		Spearman–Brown Split-Half Coefficient		Guttman Split-Half Coefficient		Composite Reliability		Average Variance Extracted	
	Study 1	Study 2	Study 1	Study 2	Study 1	Study 2	Study 1	Study 2	Study 1	Study 2	Study 1	Study 2	Study 1	Study 2
Emotional Brand Attachment (indicators are item means from the three facets of emotional brand attachment)			2 31 (92)	2 20 (92)	82	83	88[b]	82[b]	75	78	84	84	63	63
1 Affection	75	67												
2 Connection	59	59												
3 Passion	56	63												
Affection My feelings toward the brand can be characterized by			2 14 (96)	1 94 (92)	71	73	71[a]	76[a]	70	73	71	76	55	61
1 Affection	56	60												
2 Love	54	62												
Connection[c] My feelings toward the brand can be characterized by			2 63 (1 22)	2 49 (1 23)										
3 Connection														
Passion My feelings toward the brand can be characterized by			2 15 (1 02)	2 18 (1 02)	83	82	82[b]	85[b]	75	75	82	82	61	61
4 Passion	65	65												
5 Delight	63	68												
6 Captivation	55	50												
Product Involvement			2 82 (96)		88		92[b]		87		88		59	
1 Because of my personal attitudes, I feel that this is a product that ought to be important to me	85													
2 Because of my personal values, I feel that this is a product that ought to be important to me	79													

APPENDIX A
Continued

Constructs and Items	Indicator Reliability		M (SD)		Cronbach's α		Spearman–Brown Split-Half Coefficient		Guttman Split-Half Coefficien	
	Study 1	Study 2	Study 1	Study 2	Study 1	Study 2	Study 1	Study 2	Study 1	Stuc
3 This product is very important to me personally	63									
4 Compared with other products, this product is important to me	38									
5 I'm interested in this product	33									
Self-Esteem				4 27 (60)		80		82[a]		8
1 On the whole, I am satisfied with myself		59								
2 I feel that I am a person of worth		36								
3 All in all, I am inclined to think that I am a failure (reversed)		38								
4 I take a positive attitude toward myself		68								
Public Self-Consciousness				3 86 (71)		78		83[a]		8
1 I am concerned about the way I present myself		61								
2 I usually worry about making a good impression		35								
3 One of the last things I do before I leave my house is look in the mirror		38								
4 I am usually aware of my appearance		68								

[a] Equal length (estimate of the reliability if both halves have equal numbers of items)
[b] Unequal length (reliability estimate assuming unequal numbers of items)
[c] The facet is measured with one item Indicator reliability, reliability coefficients, and average variance extracted cannot be computed

Appendix B

To test the interaction effects of product involvement, self-esteem, and public self-consciousness with the relative importance of actual self-congruence as a driver of emotional brand attachment (in comparison to ideal self-congruence, i e , testing a moderation of H_3), we proceeded as follows (using the procedure of Homburg, Grozdanovic, and Klarmann 2007) For each of the three moderator variables, we first conducted a median split of our sample along the values of the variable to create two subsamples, one with low values of the moderator and the other with high values of the moderator We then analyzed the model simultaneously in both subsamples by the use of multiple group covariance structure analysis We then computed the relative importance $IMP_{asc,g}$ of the actual self-congruence for emotional brand attachment in both subsamples (g = 1 refers to the subsample in which the value of the moderator is low, and g = 2 refers to the subsample in which the value of the moderator is high) Using the respective parameter estimates, we defined $IMP_{asc,g}$ as the ratio of the effect of actual self-congruence to the sum of the effects of actual self-congruence (i e , γ_{g11}) and ideal self-congruence (i e , γ_{g12}) on the dependent variable emotional brand attachment (using the absolute values of the effects) Stated formally,

$$\text{(B1)}\quad IMP_{asc,g} = \frac{|\gamma_{g11}|}{|\gamma_{g11}| + |\gamma_{g12}|} \times 100\%$$

To test statistically whether the relative importance of actual self-congruence as a driver of emotional brand attachment differs between both subsamples, we relied on chi-square difference tests Therefore, we reran the multiple group covariance structure analysis with a constraint that forced $IMP_{asc,g}$ to be equal across both subsamples If the difference between the chi-square goodness-of-fit statistics from both analyses was significant, we inferred that the relative importance of actual self-congruence was different in both populations Because constraining $IMP_{asc,g}$ to be equal across both groups is associated with the gain of one degree of freedom, the critical value for the chi-square difference test at the 05 level is 3 84 Table B1 summarizes the results These results show that the relative importance of actual self-congruence for emotional brand attachment is higher when product involvement is high ($IMP_{asc,2}$ = 89% vs $IMP_{asc,1}$ = 53%), self-esteem is high ($IMP_{asc,2}$ = 82% vs $IMP_{asc,1}$ = 61%), and public self-consciousness is high ($IMP_{asc,2}$ = 79% vs $IMP_{asc,1}$ = 68%) The chi-square difference tests reveal that these effects are significant for all three moderators The percentage values for Group 2 for all three moderators would have been even higher (100% each) had we used the value 0 for γ_{112} Using the value 0 would have been possible because all three γ_{112} were not significant

TABLE B1
Results of Multiple Group Analysis

	Relative Importance of Actual Self-Congruence ($IMP_{asc,g}$)		
Moderator Variable	**Low Value of Moderator Variable (g = 1)**	**High Value of Moderator Variable (g = 2)**	**$\Delta\chi^2$ (Δd.f. = 1)**
Product involvement	$\|\gamma_{111}\|/\|\gamma_{111}\| + \|\gamma_{112}\| =$ 23/ 23 + 20 = 53%	$\|\gamma_{211}\|/\|\gamma_{211}\| + \|\gamma_{212}\| =$ 59/ 59 + 07 = 89%	$\Delta\chi^2$ = 8 34 ($p <$ 01)
Self-esteem	$\|\gamma_{111}\|/\|\gamma_{111}\| + \|\gamma_{112}\| =$ 41/ 41 + 26 = 61%	$\|\gamma_{211}\|/\|\gamma_{211}\| + \|\gamma_{212}\| =$ 78/ 78 + 17 = 82%	$\Delta\chi^2$ = 12 64 ($p <$ 01)
Public self-consciousness	$\|\gamma_{111}\|/\|\gamma_{111}\| + \|\gamma_{112}\| =$ 45/ 45 + 21 = 68%	$\|\gamma_{211}\|/\|\gamma_{211}\| + \|\gamma_{212}\| =$ 89/ 89 + 24 = 79%	$\Delta\chi^2$ = 5 41 ($p <$ 05)

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Facilitating and Rewarding Creativity During New Product Development

In an effort to improve creativity in the new product development process, many firms offer incentive programs, creativity training programs, or both However, creativity continues to be a construct that is not well understood in marketing, and little research has examined the joint influence of such initiatives on creative outcomes As a result, there is considerable variance in the way firms approach these issues A qualitative study of 20 firms indicates that 15 offered some type of incentive program, whereas only 7 engaged in creativity training (a subset of the firms used both) Given that previous research has consistently found that extrinsic rewards offered in isolation actually undermine the creative process (by reducing intrinsic motivation), it seems that many firms may be unwittingly hampering their own creative efforts However, two experiments demonstrate that the effect of rewards can be made positive if offered in conjunction with appropriate training Specifically, product creativity was highest when the monetary reward was paired with a dedicated creative training technique The training alters the influence of the reward such that it reinforces, rather than undermines, intrinsic motivation Managers can improve the effectiveness of their creative efforts by leveraging the use of incentives and training in combination

Keywords creativity, creativity training, extrinsic rewards, intrinsic motivation, new product development

> Creativity has always been prized in American society, but it's never really been understood While our creativity scores decline unchecked, the current national strategy for creativity consists of little more than praying for a Greek muse to drop by our houses The problems we face now, and in the future, simply demand that we do more than just hope for inspiration to strike
>
> —Bronson and Merryman (2010, p 49)

Corporations have a vested interest in promoting creativity among their employees and stakeholders The success of new product development (NPD) efforts, for example, depends to a great extent on the creativity of the ideas underlying them (Scanlon and Jana 2007) In a recent IBM poll of 1500 chief executive officers (CEOs), creativity even edged out integrity as the most important leadership quality for business success (Carr 2010) Although business leaders broadly acknowledge the importance of creativity, the methods for achieving creative thought remain elusive

Creativity is commonly defined as the production of something that is both original and useful (Amabile 1996, Bronson and Merryman 2010, Runco 1997, Smith, Ward, and Finke 1995, Sternberg 1999) For example, a creative new product would be one that differs from existing products in a novel way but is still effective (or even more effective) in accomplishing the purpose for which it was intended Although this definition of creativity is widely accepted, Hauser, Tellis, and Griffin (2006) argue that marketing academics must do much more to provide insights that help firms achieve their creative aims In their influential review of innovation in marketing, Hauser, Tellis, and Griffin name creativity in the "fuzzy front-end" of NPD as a critical research priority Specifically, they call for more research on such issues as how to structure incentives to motivate employees to be more creative and how to develop tools to facilitate creativity

Our research directly addresses these issues by first examining firms' actual approaches to encouraging and rewarding creative thought In this initial qualitative study, we interview senior executives at 20 firms to understand the role of creativity in their organizations and how it is fostered We then conduct two experiments to test the effectiveness of two key managerial tools, rewards and creativity training, in enhancing an individual's creative performance

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These studies find that the interaction of these two variables matters when producing creative product outcomes. Namely, we find that creativity training alters the reward influence such that it turns a typically neutral or negative effect into a positive one. Although previous work has examined the influence of extrinsic rewards and the influence of creativity training independently, little research has considered their joint influence. This is an important oversight, given the prevalence of training and incentive programs in industry.

Our studies contribute to the marketing literature in two ways. Managerially, our qualitative study establishes the variance in approaches and beliefs that firms have in encouraging creative thought. Our experiments then demonstrate how rewards and creativity training, both of which are easily implemented, may enhance the creative thinking of those engaged in the fuzzy front-end of NPD.

Theoretically, our experimental results introduce an important moderating factor in the relationship between rewards and creative product outcomes. The effect of extrinsic incentives (e.g., rewards) on creativity has been a point of long-standing debate within both marketing and psychology (see, e.g., Cameron and Pierce 1994; Deci, Koestner, and Ryan 1999a, b; Eisenberger, Pierce, and Cameron 1999; Eisenberger and Shanock 2003; Lepper, Green, and Nisbett 1973; Lepper, Keavney, and Drake 1996; Ryan and Deci 1996). The majority of these studies find that rewards undermine the creative process by diminishing intrinsic motivation (i.e., the motivation to engage in an activity for its own sake; see Collins and Amabile 1999; Csikszentmihalyi and Getzels 1973; Deci, Koestner, and Ryan 1999a; Ryan and Deci 2000).

A few empirical studies using schoolchildren, however, find that rewards can enhance creativity when some form of creativity training accompanies them (e.g., Eisenberger, Armeli and Pretz 1998; Eisenberger and Selbst 1994). The training cues children that creativity is expected (and rewarded) by others (e.g., teachers, parents), and therefore, they exert greater effort in this direction. Our findings are novel, however, because they demonstrate that rewards, when accompanied by appropriate training, can enhance (not diminish) intrinsic motivation, which in turn facilitates creative outcomes. Intrinsic motivation is particularly important in complex and effortful creativity tasks such as NPD.

Study 1

The goal of this study was to better understand managers' strategies for obtaining and rewarding creative thought in their organizations. We recruited respondents by using a snowball technique, in which we began with our own university contacts and relied on informants to identify additional people who would be particularly knowledgeable about this topic. This technique produced 20 interviews with a variety of marketing and NPD executives (for company and contact profiles, see Table 1). Our sample was diverse and included firms with annual revenues ranging from $25 million to $79 billion, in industries ranging from chemicals to natural foods, and in countries in North America, Europe, and Asia. Interviews lasted from 25 to 75 minutes (the average duration was 40 minutes). Each interview was recorded and transcribed (with the exception of two interviews with informants who declined to be recorded).

The interviews followed a semistructured format in which we used an initial set of prepared questions to guide the interview, supplemented with specific follow-up questions based on each informant's individual responses. We drew this

TABLE 1
Firm Descriptions

Company	Industry	Informant	Annual Revenue (in US$)
1	Consumer products	North American category director	$79 billion
2	Foods/snack foods	Asia Pacific president	$48 billion
3	Consumer electronics	Product market research manager	$43 billion
4	Household appliances	Vice president of innovation and global product development	$19 billion
5	Specialty chemicals	President of marketing: Asia Pacific and Middle East	$15 billion
6	Medical devices/supplies	Vice president of research and development	$10 billion
7	Hotels/hospitality	Global director of luxury and lifestyle brands	$9 billion
8	Confectionary	Global chocolate director	$8 billion
9	Retail apparel	Business integration manager	$8 billion
10	Energy	Project director	$6 billion
11	Foods and cereals	Brand manager	$5 billion
12	Industrial products	Director of product development	$5 billion
13	Fragrances/beauty products	Regional managing director—Far East	$4 billion
14	Processed foods and meats	Director of product development and innovation	$2 billion
15	Liquor distribution	Director of human resources	$900 million
16	Natural foods	Vice president of marketing and product innovation	$300 million
17	Railway travel	President	$200 million
18	Network software	Vice president of marketing	$50 million
19	Children's apparel	President and CEO	$30 million
20	Apparel design	President and CEO	$25 million

approach from grounded theory and selected it because, of the major qualitative techniques, it is among the most amenable to mixed-method research (Corbin and Strauss 2008; Creswell 2008). It has also been used successfully in numerous past marketing studies (see, e.g., Dahl and Moreau 2007; Flint, Woodruff, and Gardial 2002; Fournier and Mick 1999; Keaveney 1995; Noble and Mokwa 1999). The three general questions that guided the interviews were as follows: (1) In what areas or functions within your company is creativity deemed important and valuable? (2) What structures or programs are in place to encourage creative thinking among your employees? and (3) Do you use any type of incentive programs to enhance the creativity of your employees?

The first of the three questions yielded relatively consistent results across the diverse set of firms. Of the 20 respondents, 17 mentioned product innovation and NPD as the areas in which creativity was most critical to their organization, and 11 also mentioned that marketing benefited greatly from creative thought. Six respondents mentioned internal processes and operations as key areas, and one interviewee mentioned that creativity had been critical in the cost-cutting initiatives his firm had taken. The second two questions, however, yielded significantly more variance across the firms, and responses to each of those questions are described in greater detail in the following section.

How Firms Obtain Creative Insights

As Table 2 highlights, the firms in our sample used a wide variety of methods to obtain creative insights. Some of these firms outsource many of their creative tasks and rely on outside consultants to assist them in their creative endeavors. This practice is used much more heavily by the larger firms in our sample (firms are numbered in reverse order of size). When asked why they outsource their creative activities, one respondent explained that it is because "it's difficult, and there are people over time who build a great amount of expertise in the innovation area." That said, an executive from one large firm with whom we spoke said that the company started out relying heavily on consultants but decided that creativity and innovation were too critical to outsource completely. Thus, the company now relies on a balanced model in which consulting firms are used to enhance its own internal innovation efforts.

Respondents from two firms reported that they either do their own internal creativity training (e.g., TRIZ) or encourage their employees to follow their proprietary approach to creativity (e.g., Converter; see Table 2). Five of the firms reported using informal brainstorming sessions on an ad hoc basis, whereas six firms did nothing to enhance the creativity of their employees. A respondent from one of the larger firms in this "no-strategy" category explained that "you can't teach creativity." However, this belief stands in direct contrast to a great deal of previous research noting just the opposite (for a review and meta-analysis see, e.g., Carr 2010; Scott, Leritz, and Mumford 2004a).

How Firms Incent and Reward Creative Insights

We observed similar variance in how the firms in our sample approach and use extrinsic incentives for rewarding creativity (see Table 3). Seven of our respondents, across firm size and industry, reported using some type of public recognition to identify and appreciate employees' and/or team contributions of creative ideas. Most of these rewards were described as nonfinancial (e.g., a plaque presented in a public forum such as an annual banquet). Similarly, five other firms reported using prizes as recognition for employees' or teams' creative accomplishments. These prizes tended to be small. One respondent described receiving "cheesy" retailer gift cards

TABLE 2
How Firms Approach Creative Insights

Approach to Creativity	Explanation	Firms Engaged	Key Quotes
Outsource	Hiring an outside ideation/innovation firm (e.g., Eureka Ranch, Strategos) for creative activities	1, 2, 4, 7, 8, 9, 11	"It's difficult, and there are people over time who build a great amount of expertise in the innovation area." – #8
Internal training: TRIZ	Training in a known method for generating innovative ideas; TRIZ provides tools for problem definition, system analysis, and an algorithmic approach to creativity	6	"We're training our six sigma people to be TRIZ facilitators so that we can do our training in-house. Typically, the engineers and scientists from R&D and manufacturing are the ones that go."
Internal approach: Converter	Using cross-functional teams that respond to a "catalyst stimulus" with a brainstorm followed by a fun, two-day excursion	14	"The last thing that we want people to do if we're going to improve our number-one branded product is to start thinking about our number-one branded product."
Internal activities: Informal brainstorming	Using product-focused ideation sessions	3, 5, 10, 16, 18	"We look for trends in different industries and brainstorm about how it is relevant to ours." – #16
None	Using no formal or informal approach for obtaining creative ideas	12, 13, 15, 17, 19, 20	"You can't teach creativity." – #13

Notes: Firm numbers refer to those listed in Table 1.

TABLE 3
How Firms Incent/Reward Creative Insights

Type of Incentive	Explanation	Firms Engaged	Key Quotes
Public recognition	Recognize individuals at public events (e.g., annual banquets) with nonfinancial awards	2, 5, 7, 8, 12, 15, 18	"We give nonfinancial awards across the organization. 'Best Product of the Year.'" – #8
Inclusion in the job description	Innovation and creativity are built into certain job descriptions, employees' evaluations reflect performance on these dimensions, and merit increases are affected by them	4, 5, 10, 17	"The innovation side is written into certain positions, so those people have incentives for innovation and creativity." – #10
Prizes	Employees or teams of employees receive gift certificates, trips, or dinners	3, 10, 14, 16, 18	"People with the highest scores on their ideas get gifts in ideation sessions." – #3
Financial bonus based on firm or team performance	Employees receive a bonus when the firm hits its financial or performances metrics for innovation	3, 5, 18	"Unless it gets business results, nothing gets monetary innovation awards." – #5
Financial bonus for individual	Employee receives a bonus when he or she obtains a patent or makes other significant NPD creativity contribution	1, 6	"You can get money for patent disclosure and a patent award. Disclosure is $1,000 and award is $10,000." – #6
None	No formal or informal extrinsic incentives for creative performance	9, 11, 13, 19, 20	"It [creativity] is in the culture and it's expected." – #19

Notes: Firm numbers refer to those listed in Table 1.

given for the "wackiest" ideas in a new product ideation session. However, in another firm the prize was much more substantial: a trip to Paris for the development team, awarded in conjunction with the launch of a promising new product.

Some firms used rewards with even more significant repercussions. At four firms in our sample, innovation and creativity were formal expectations of certain employees. The annual merit raises for these people depended in part on their performance in these areas. Three firms also used financial bonuses to reward a team's creative accomplishments, and two reported using bonuses to reward individual achievements. In one case, the reward approached $10,000 (for securing a patent). Interestingly, five of the firms in our sample reported using no extrinsic rewards. As one respondent explained, "Creativity is in the culture and it's just expected."

Innovation Consultants

One of the more interesting findings to emerge from these interviews is the large firms' reliance on outsourcing their creative efforts. Although this decision to outsource is consistent with the increased specialization characteristic of these large firms, it is also surprising, given their significant access to vast internal resources. To better understand how these innovation consultants develop and contribute creative ideas, we sought principals at three respected innovation consulting firms who, according to one of the CEOs, "teach people to fish." All three of these firms made heavy use of creativity training. As summarized by the president of one firm: "Creativity is 94% process and system, it's 6% employee. Most firms get it exactly backwards."

Not surprisingly, all three consulting firms were systematic in their approach to creativity. One firm trains its people in analogical thinking and visualization to improve ideation results. The second firm trains people to structure their ideation sessions into three levels of opportunities from which they start the ideation process. The third firm recognizes the value that constraints play in the creative process. To them, the key is combining discipline and processes to achieve creativity. Consultants either work with the firms' employees during ideation sessions or they do the creative development themselves with guidance from the firm.

The consultants did not have a great deal to offer regarding advising firms on the use of incentives and rewards. Two of the three respondents did not comment specifically on the role of extrinsic rewards. The third respondent came down solidly against them: "Just take away the extrinsic incentives."

Discussion

Overall, our findings from this qualitative study are consistent with research showing that firms overwhelmingly recognize the importance of creative thought in innovation and NPD (see Scanlon and Jana 2007). However, our results also show surprisingly little consistency across firms in obtaining and rewarding creative insights from their employees. Firms follow a variety of approaches for facilitating and rewarding creativity, and our findings reveal relatively extreme perspectives on whether creativity could be taught. However, considering the historical challenges involved in teaching creativity and the equivocal results reported in the academic literature, these extreme attitudes seem less surprising.

Although some firms believed in combining creativity training (e.g., TRIZ) with substantial extrinsic rewards (e.g., $10,000 for a patent filing), others believed that creativity could not be taught and/or that rewards were detrimental to creative efforts. Thus, to provide more clarity on the relationship between extrinsic rewards and different types of creativity training, we used an experimental approach with creative tasks that closely approximate the types of challenges firms face in the early stages (e g , the fuzzy front-end) of their NPD processes In the following sections, we first review the literature on extrinsic rewards, training, and creativity and then describe our tests of the theories

Extrinsic Rewards and Creativity

A considerable body of evidence now suggests that rewards undermine creativity (see Amabile 1996, Deci, Koestner, and Ryan 1999a) Rewards are believed to erode creativity by reducing intrinsic motivation (i e , a person's inherent interest in the task or activity for its own sake) Intrinsically motivated people are often described as becoming absorbed in a task and deriving enjoyment from the challenge it provides Conversely, those who experience low intrinsic interest find an activity to be tedious and boring Because creativity is mentally taxing and often requires sustained effort, intrinsic motivation is considered critical to this process (see, e g , Amabile 1996)

How do rewards diminish intrinsic motivation for creative tasks? The provision of a reward is believed to cause an interpretive shift in the person's reason for engaging in the activity Effort shifts from being put forth out of sheer interest to being supplied strictly as a trade for compensation (Amabile 1996) Essentially, the provision of the reward causes the task to be "defined more narrowly (simply as a means to an extrinsic end, rather than as an opportunity for exploration and cognitive play)" (Amabile and Cheek 1988, p 60) Again, because creativity usually requires sustained effort, this loss of intrinsic motivation is believed to more than offset whatever benefits the reward otherwise provides Some of the earliest evidence of this effect came from the field of education, in which educators found that their attempts to rechannel children's natural curiosity into academic exercises (replete with grades, stars, and so forth) resulted in a sharp loss of interest (Lepper, Greene, and Nisbett 1973)

However, people do work for compensation, even in creative fields Thus, researchers began to wonder whether extrinsic rewards must always undermine creativity The "immunization studies" program, conducted by Hennessey and colleagues (Hennessey, Amabile and Martinage 1989, Hennessey and Zbikowski 1993), was one of the first studies to challenge this premise These researchers speculated that people might be buffered against the demotivating effects of rewards, depending on their interpretation of the role of the reward in the creative process They reasoned that a reward can be interpreted either as constraining (i e , as an attempt to exert external control) or as informational (i e , providing useful information) If perceived as informational, the reward could contribute to a positive affect and intrinsic motivation (Hennessey, Amabile, and Martinage 1989)

To test their premise, Hennessey and colleagues showed some students a videotape in which the intrinsic aspects of performing well in school were emphasized (e g , how enjoyable it is to learn something new, the sense of accomplishment a person feels from working hard) Students in a control condition were shown no such video Similarly, some students were offered an extrinsic reward as part of the study, whereas others were offered no such reward Students were then asked to compose a brief story that was later evaluated for creativity Consistent with their prediction, students who were shown the video *and* were offered a reward exhibited higher levels of creativity than students who had only been exposed to one condition or the other

However, when Hennessey and colleagues attempted a more comprehensive replication of the original findings, they were unable to reverse the negative influence of extrinsic rewards, only to neutralize it (Hennessey and Zbikowski 1993) Given the difference between something beneficial versus something benign, they cautioned researchers not to be "too quick to abandon our original notions" of the negative influence of extrinsic rewards on creativity and to seek out new moderators of this relationship (Hennessey and Zbikowski 1993, p 304) We propose that creativity training is one such moderator

Creativity Training

A substantial body of creativity research has focused on whether it is possible to train ordinary people to be more creative (e g , Basadur, Graen, and Green 1982, Gordon 1968, Khatena 2000, Osborn 1963, Renzulli 1986) The results from this research (conducted largely outside the business realm) show that creativity training can make a substantive difference A meta-analysis by Scott, Leritz, and Mumford (2004a) reveals an average effect size of 68 for creativity training programs, whereas Ma (2006) reports an even higher effect size of 77 Indeed, research has shown that even a single training session can enhance creative abilities and outcomes (Clapham 1997, Dahl, Chattopadhyay, and Gorn 1999) Although early training programs were hit or miss, as research has uncovered the essential elements of the creative process (e g , lateral connection, analogical reasoning, divergent and convergent thought), training techniques have become even more refined (e g , Baer 1997, Khatena 2000, Parnes 1999)

Although a variety of approaches to creativity training have been developed over the years, two of the most prominent approaches are creative idea production training and creative imagery training (Scott, Leritz, and Mumford 2004b) Although these two forms vary in terms of objectives and approach, both make use of different types of visualization, and both have been shown to be effective in enhancing creativity (Scott, Leritz, and Mumford 2004b)

Creative Idea Production Training

Creative idea production training emphasizes the use of idea generation and elaboration in response to concrete and realistic problems and situations This approach encourages the person to visualize how someone might experience a problem and new ways in which it can be solved (Finke 1997) A goal of creative idea production training is to leverage and enhance the mind's capacity for mental image manipulation (Newell and Simon 1972) An example of this type of training in the marketing literature comes from Dahl, Chattopadhyay, and Gorn (1999), who use the technique to induce young engineers to think more empathetically about challenges that the elderly face while driving, particularly when trying to change a flat tire. By seeing a problem and its potential solutions through the eyes of another, engineers who received the training were able to substantially improve on the design of a traditional car jack, compared with their untrained counterparts. Creativity inherently involves a certain amount of trial and error; therefore, being able to mentally manipulate various solutions (without having to actually implement them all) can be of tremendous benefit to creative problem solving (Jay and Perkins 1997; Newall and Simon 1972).

Creative Imagery Training

In contrast, creative imagery training is less specific than idea production training. This family of techniques relies heavily on free association, with the goal of enhanced lateral thinking (i.e., making connections across distal conceptual planes) and, as such, tends to be more imaginative in emphasis. For this reason, unrealistic or improbable scenarios are often used to leverage the mind's capacity for visualization and conceptual manipulation. For example, Khatena's (2000) "divergent-symbolic" production task (one of the better-known creative imagery training techniques) asks participants to imagine a set of inanimate objects contained in a box coming to life. Participants are asked to write a story about these objects coming together to play. Although this exercise is highly improbable and not problem specific, it is designed to stimulate imaginative thinking and push conceptual boundaries with the understanding that such thinking may benefit creativity in subsequent unrelated tasks by helping participants break free of fixation (Scott, Leritz, and Mumford 2004b). Therefore, imagery training is designed to overcome mental blockages and produce moments of insight (Scott, Leritz, and Mumford 2004b).

Interaction Between Extrinsic Rewards and Creativity Training

There has been little research examining how extrinsic rewards influence the effectiveness of creativity training. As noted previously, training can positively influence creative outcomes, but why it does so remains an open question. The one marketing study that examines the relationship between creativity training and product outcomes (Dahl, Chattopadhyay, and Gorn 1999) does not include intrinsic motivation or extrinsic influences on the creative process. Therefore, the authors are unable to comment on how training influences intrinsic motivation or how extrinsic incentives might alter the equation. Does training work because it increases intrinsic task motivation, or does it work simply because it helps people work smarter at a creative task?

Training may do both. People may work smarter because they have better skills, and they may work harder because they are more intrinsically motivated (i.e., people are more naturally interested in things they believe they are good at doing). The answer to this question has implications for managers' strategies for facilitating creative thought. If training at least partly enhances intrinsic motivation, the provision of a reward could serve to further reinforce task engagement. This would coincide with the reality that people who work in creative fields do so because they are highly motivated and because they expect to be well compensated for their efforts. Therefore, managers who understand how to combine tools to maximize creative performance stand to enhance their firms' NPD efforts.

Overall, the lack of research on this interaction is surprising, especially with respect to NPD. The limited research into the joint influence of rewards and training on creativity (e.g., Eisenberger, Armeli, and Pretz 1998; Eisenberger and Selbst 1994) has occurred in the field of education. These studies reveal that incentives can be used to get children to produce more creative drawings, but only if the children are first primed to think of unusual uses for common objects. They suggest that the priming task cues children that creativity is expected and will be rewarded by others such as parents or teachers. Although such extrinsic influences may be sufficient to promote creativity in a children's drawing task (for which the mere choice to make a free drawing instead of copying one was sufficient to be deemed "creative"), the question remains whether they would be sufficient to sustain creative effort in more challenging tasks (Deci, Koestner, and Ryan 1999b). Given this, the applicability of these findings to a NPD context is probably limited.

Our view is that training could reverse the otherwise negative or neutralizing influence of rewards on creativity in an NPD task by bolstering intrinsic motivation. Because creativity training emphasizes divergent thinking, visualization, and exploration, it provides people with two distinct but important gifts: (1) the cognitive tools to actually work smarter and (2) a feeling of increased competence during the creative task. Research shows that when people feel more competent, their task enjoyment is increased (Dahl and Moreau 2007; Deci, Koestner, and Ryan 1999a). We propose that training may not only give people a tool to be more creative, it may also enhance their level of intrinsic motivation. In such cases, rewards and training would become mutually reinforcing (not offsetting), because the reward affirms a person's own internal creative efforts. Conversely, for those who do not receive training, a reward is likely to be interpreted as a type of bribe used to induce someone to do something that he or she may otherwise be reluctant to do, and, as past research has shown, this is generally not a sustainable way to increase creative effort (Deci, Koestner, and Ryan 1999a).

We test this proposition in Studies 2 and 3. To enhance the generalizability of our findings, we test our ideas using the two types of creativity training described previously. Study 2 examines the relationship between creative idea production training and extrinsic rewards, and Study 3 focuses on creative imagery training and those same rewards. To better understand the mechanism by which the results are achieved, the second study also assesses the role of intrinsic motivation explicitly.

Study 2

Research Design

Two experimental factors (extrinsic rewards and creative idea production training) were manipulated in a 2 × 2 between-subjects design Participants in the study were 122 undergraduate engineering students at a major midwestern university who were given nominal compensation in exchange for their participation All participants had also completed their required design course work at the time of the experiment A form of creative idea production training (specifically customer-focused visualization) was the creative-thinking skill made accessible in the study (Dahl, Chattopadhyay, and Gorn 1999)

To ensure that no unintended confounding factors influenced task performance, participants completed the study individually As another control, one research assistant conducted all 122 sessions over a three-week period On arrival at the session, the participant was randomly assigned to one of the four treatment cells If the participant had been assigned to one of the creativity training conditions, the research assistant provided it at the beginning of the session After the training manipulation (if provided), all participants received a description of the design task The product design task was the same as that used by Dahl, Chattopadhyay, and Gorn (1999)—namely, to devise a new car jack for use by elderly adults (i e , people aged 60 years or older) to change a flat tire The specific description was as follows

> You are asked to develop an innovative and effective car jack design for elderly adults (age 60+) Please produce a thumbnail sketch of your design and include any brief written comments that are necessary to explain your design Please disregard any economic, material, or regulatory constraints as you develop your idea You have up to one hour to complete your design

For participants in the monetary rewards condition, a description of those rewards then followed (see the following section) The research assistant next indicated that the participant should first spend some time using scratch paper to sketch out initial design ideas and then draw the final design on special bond paper After the participant had finished the design task, he or she completed a questionnaire that contained background measures and a set of manipulation checks

Independent Variables

Creative idea production training Participants who received creative idea production training were provided with the following information

> In solving design problems, many designers find that forming visual images (pictures in the mind) can help them produce innovative and effective designs One visualization strategy that has been shown to aid in the design process involves visualizing the *potential customer of the product* Seeing in your mind a product user being involved and interacting with a proposed product design can facilitate the development of design solutions

After these initial instructions, the designers were given a brief training task (for the full training regimen, see the Appendix) The training task used a guided-visualization procedure in which participants read a short story about a young adult putting together a television stand As the participants read the short story, they were instructed to stop after reading each sentence in the story and try to picture in their minds the events about which they had just read The idea was to sequentially break down the assembly process and recognize the specific challenges and problems customers would face at each step

Extrinsic rewards Participants in the conditions offering extrinsic rewards for the design task received the following information

> Three cash prizes will be awarded to the students producing the first-, second-, and third-rated designs ($250, $100, and $50, respectively) Outside judges from the target market for the product will evaluate the designs, and the winning designs will be selected from these evaluations

No such information was provided to participants in the no-extrinsic-reward condition To ensure the effectiveness of the manipulation, we performed a pretest, which confirmed that the judges' evaluations and the monetary rewards were believable and not seen to limit the way the designer performed the task After the experiment was complete, the three highest-rated designs were then selected from the designs produced across all conditions, and the winners were notified and given their prizes

Dependent Variable

Two consumer judges from the target market (i e , drivers over the age of 60 years) were recruited to evaluate the creativity of each product design (Dahl and Moreau 2002, Goldenberg, Mazursky, and Solomon 1999) Each judge received a booklet containing the 122 designs The order of the designs was randomized across the booklets The judges were blind to the identity of the participants, to one another, and to the purpose and conditions of the experiment They were each paid $100 for their services

Each judge completed an established six-item measure of the creativity of each design (see Moreau and Dahl 2005) Because creativity is commonly defined as the production of ideas considered both novel and useful (Burroughs, Moreau, and Mick 2008, Lubart 1994, Sternberg 1988), we used three items to capture each of the two dimensions (Moreau and Dahl 2005) The items (on a seven-point scale) were "not at all original/very original," "not at all innovative/very innovative," "not at all novel/very novel," "not at all useful/very useful," "not at all effective/ very effective," and "not at all sensible/very sensible " Because we were interested in overall creativity, we summed across all six items rather than keeping the novel and useful dimensions separate This process is in keeping with a considerable amount of previous research on creativity that argues that both dimensions must be considered simultaneously, because one dimension without the other is not creative (see, e g , Lubart 1994, Plucker and Renzulli 1999, Smith, Ward, and Finke 1995) The combined approach has also been used in past marketing studies of creativity (Andrews and Smith 1996, Burroughs and Mick 2004, Sethi, Smith, and Park 2001)

Following established procedures for assessing the validity of a measure involving multiple judges (Cicchetti 1994), we made a two-step assessment of our creativity scale First, we calculated the coefficient alpha for each judge Alpha estimates for the judges individually were high (Judge A α = 88, Judge B α = 79), therefore, second, we examined the level of agreement across judges by calculating the intraclass correlation coefficient (ICC). Using the ICC is appropriate for research that involves multiple judges (compared with the Pearson product-moment correlation), because it accounts not only for the degree to which rater judgments covary (i.e., move up or down in unison) but also for the level of absolute agreement in the raters (i.e., high/high, medium/medium, low/low creativity; Cicchetti 1994). This is a more stringent test because it ensures that independent evaluators are viewing the creativity of the design at approximately the same level. The ICC was also high (.86). Thus, we averaged across the judges' ratings to create a composite score for the creativity of each design in the study (M = 3.8, range: 2.0 to 5.8) (Burroughs and Mick 2004; White and Smith 2001).

Results

Participants were told that they would have up to an hour to complete the design task, though the research assistant did not stop them after they began working. The sessions were as short as seven minutes and as long as 119 minutes. The average session lasted 38 minutes.

In addition to the focal variables of interest in the research, several manipulation checks were included in the experiment. We assessed the effectiveness of the extrinsic reward manipulation by measuring the level of reward recall at the end of the study. We also assessed the effectiveness of the creativity training process. Two scale items assessed the extent to which participants visualized the customer and used images while developing their designs (1 = "did not visualize," "use images of the customer," and 7 = "visualized," "used a lot of customer images"). In addition, in an open-response question, participants listed and described the customer images, if any, that they used during the design task. Two research assistants, blind to the purpose of the study, assessed each designer's list and description of their customer images and reported the number of times the participant reported visualizing an elderly person using a jack. Agreement between the research assistants was high (ICC = .87); therefore, their responses were averaged. Each of the three measures (two self-report + one rated) was then standardized and summed to form an index of customer visualization (α = .96).

The awareness check for the reward manipulation showed that the procedure had made the award salient to participants as intended. In addition, a two-way analysis of variance (ANOVA) revealed that, as intended, only the training manipulation significantly predicted the extent to which the participant visualized the consumer during the design task (M_{training} = .43 vs. $M_{\text{no training}}$ = –.32; $F(1, 121)$ = 4.67, $p < .05$). Given this confirmation of our manipulations, we turned to examining their effect on our primary variable of interest, creativity.

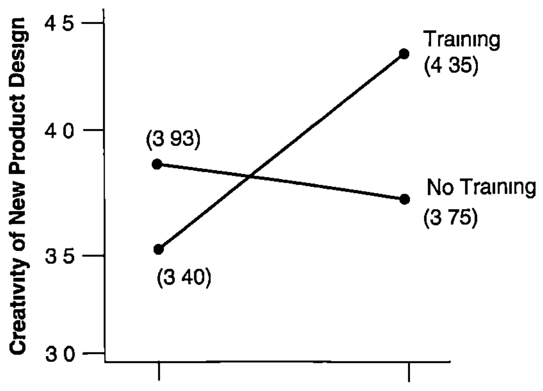
We used a two-way ANOVA to assess the influence of the manipulations on design creativity. The results reveal a main effect of extrinsic rewards on creativity; designs created in conjunction with extrinsic rewards are rated as more creative than those produced in the absence of such incentives (M_{reward} = 4.03 vs. $M_{\text{no reward}}$ = 3.66; $F(1, 121)$ = 6.63, $p < .01$). However, as predicted, the influence of extrinsic rewards is contingent on whether the participants had also received creativity training (interaction $F(1, 121)$ = 14.72, $p < .001$). Follow-up contrasts show that the designs created when both training and extrinsic rewards were provided were significantly more creative than those developed under any of the other three conditions in the experiment. In the absence of training, the provision of the reward actually causes creativity to go down slightly albeit not significantly. Figure 1 provides a full depiction of the interaction, and the relevant contrast statistics are as follows: $M_{\text{training, reward}}$ = 4.35 vs. $M_{\text{no training, reward}}$, = 3.75, $F(1, 60)$ = 8.09, $p < .01$; $M_{\text{training, reward}}$ = 4.35 vs. $M_{\text{training, no reward}}$ = 3.40, $F(1, 60$ = 20.17, $p < .001$; and $M_{\text{training, reward}}$ = 4.35 vs. $M_{\text{no training, no reward}}$ = 3.93, $F(1, 60)$ = 3.87, $p < .05$.

Discussion

The results of this study demonstrate that by combining creativity training with an extrinsic reward, it is possible to enhance the creativity of the outcomes produced in a new product design task. In this study, we used creative idea production training to help participants visualize the potential customer (an elderly person) engaged in the task (changing a flat tire). This type of training emphasizes concrete, problem-specific processing and task-relevant visualization. Again, the results show that this type of thinking, when combined with extrinsic rewards, enhanced the creativity of the designs produced.

However, our results do not tell us how these two managerial tools combined to enhance participants' creativity. Neither the extrinsic reward nor the creativity training influenced the amount of time spent on the creative task in this study. Thus, it is not a story of pure task persistence. Rather, the story seems more complex. In Study 3, we test the proposition that rewards and training will be mutually reinforcing to intrinsic motivation as an intermittent factor in the creative process. For those who receive creativity training, the rewards may encourage the people who are already working smarter to also work harder, and when they do so, their intrinsic motivation may increase because they feel more competent in approaching the task. The next study is also designed to help generalize the findings to a different type of creativity training.

FIGURE 1
Creative Idea Production Training × Extrinsic Reward Interaction



Study 3

Research Design

This study used a 2 × 2 between-subjects experimental design, with the two manipulated factors being extrinsic rewards and creativity training This time, however, training took the form of creative imagery training Otherwise, to maintain continuity with the first experiment, the conditions and procedures were the same The new product context was again the design of a car jack for an elderly person Study participants were engineering students (n = 110) at a major West Coast university who received nominal compensation for their participation Participants completed the study individually under the administration of a research assistant

Independent Variables

Creative imagery training Participants assigned the training manipulation again went through a creativity training session, only this time they were trained by using Khatena's (2000) divergent-symbolic production technique Whereas participants in the first study went through a customer-visualization exercise that was focused on the specific problem at hand, Khatena's program uses mental imagery in a more generalized way Although the process is somewhat involved (for a full description, see Khatena 2000, chap 8), it essentially takes participants through a series of visualization steps First, participants are asked to imagine that there is a box in a corner of the room They are then asked to close their eyes and imagine what is inside the box They write down as many of the objects they can recall thinking of and then group them together according to common properties They are then instructed to once again close their eyes, visualize one of the object groupings, and imagine them coming to life Specifically, participants must imagine the objects as characters in a play and write their story Although Khatena's training programs were originally formulated to enhance the creativity of gifted children, they have been used widely in adult populations (Khatena 2000) The technique is designed to stimulate imaginative thinking and facilitate mental image production and manipulation

Extrinsic rewards As with the first experiment, half the participants in the study were told that their designs would be judged for creativity and that cash prizes of $250, $100, and $50 would be awarded to the top three designs No such prize was offered to participants in the no-extrinsic-reward condition When the full experiment was complete, prize winners were selected from all experimental conditions, and the winners were given their prizes

Dependent Variables

Creativity Two consumer judges (different from those used in the first study but also over the age of 60 years) judged the creativity of the car jack designs Judges were each provided a booklet containing all the designs along with a set of rating forms (containing the same creativity scale as that in Study 2) Judges were paid $100 for their services When the judges completed their task, we ascertained the internal consistency and level of interrater agreement in the creativity ratings Alpha for the scale for Judge A was 84, and for Judge B it was 78 The ICC coefficient between the judges was 87, which indicates high agreement in their assessments (Cicchetti 1994) Thus, as with Study 2, the ratings were averaged across judges to form an overall creativity score (M = 3 6, range 1 0 to 5 6)

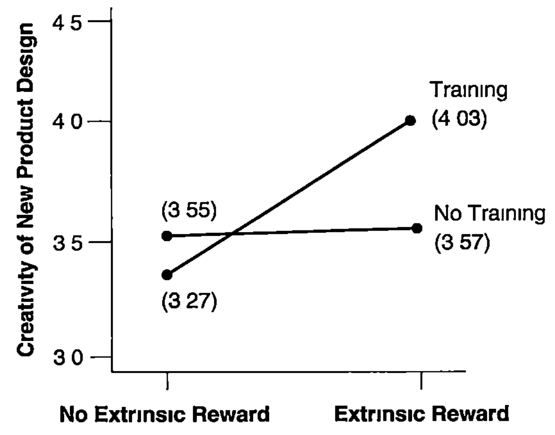
Intrinsic motivation Because intrinsic motivation is at the center of the controversy over the effect of extrinsic rewards on creativity, we included it as a second dependent variable in the design Intrinsic motivation can be ascertained at either a general level—such as for a hobby or job (Amabile et al 1994)—or for a specific task Given that our interest was in how the provision of a reward would influence creativity in a new product task, we focused on the latter form of intrinsic motivation We could identify no measure of intrinsic motivation specific to new product design, therefore, we constructed a new measure guided by the literature (Amabile et al 1994, Harackiewicz, Sansone, and Manderlink 1985, Shalley and Perry-Smith 2001) Recall that intrinsic motivation reflects inherent task interest (Amabile 1996, Csikszentimihalyi 1996) and is indicated by such things as the extent to which the person finds the activity exciting, interesting, and challenging (Amabile 1996) It is also characterized by the extent to which a person becomes engrossed in what he or she is doing and finds the activity fulfilling (Csikszentmihalyi 1996) Using these as our guiding concepts, we constructed a five-item measure of task intrinsic motivation that study participants completed after doing the design task Using a seven-point semantic differential format, this measure assessed the extent to which they found the new product design task interesting, exciting, challenging, engrossing, and fulfilling (vs uninteresting, boring, annoying, shallow, and unfulfilling) The results of factor analysis suggest that the scale was unidimensional (all item loadings > 60, the first factor accounted for 51% of the variance) Reliability for the scale is α = 75

Results

To validate the extrinsic reward manipulation, designers again indicated their recall of the reward offered at the conclusion of the study The creativity training manipulation was validated by ensuring that the designer completed Khatena's divergent symbolic production task as a first step in the experimental process and that all the participants met these criteria respective to their condition Given this, we turned to analyzing the effects of our independent variables on design creativity

Creativity We used ANOVA to test the effects of extrinsic rewards, creativity training, and their interaction on the creativity of the product designs Training exhibited no main-effect influence on creativity, whereas extrinsic rewards exhibited a significant positive influence, as it had in Study 2 (F(1, 106) = 5 50, $p <$ 02) However, like Study 2, this main effect is qualified by a significant interaction between the two independent factors (F(1, 106) = 5 01, $p <$ 03) As Figure 2 shows, when no training was provided, extrinsic rewards did nothing to improve the creativity of the outcomes produced However, among participants who received training, the story is markedly different Here, as in

FIGURE 2
Creative Imagery Training × Extrinsic Reward Interaction



the previous study, there is a pronounced increase in the creativity of the designs among those who received an external reward compared with their unrewarded counterparts (contrast $M_{\text{training, reward}} = 4.03$ vs $M_{\text{training, no reward}} = 3.27$, $F(1, 54) = 10.13$, $p < .002$). Moreover, participants who received training along with an extrinsic reward exhibited significantly higher levels of creativity than in any of the other conditions of the study (contrasts $M_{\text{training, reward}} = 4.03$ vs $M_{\text{no training, reward}} = 3.57$, $F(1, 54) = 4.92$, $p < .03$, $M_{\text{training, reward}} = 4.03$ vs $M_{\text{no training, no reward}} = 3.55$, $F(1, 55) = 4.89$, $p < .03$).

Intrinsic motivation. This study was also designed to examine the role of intrinsic motivation in the creative process. To investigate this variable, we performed the following analyses. First, we ran the same two-way ANOVA as for our creativity measure but substituted intrinsic motivation as the dependent variable. The results support an important role for intrinsic motivation and reveal a significant interaction ($F(3, 104) = 7.20$, $p < .01$). Among participants who were untrained, the provision of an extrinsic reward had a negligible effect on intrinsic motivation ($M_{\text{no training, no reward}} = 3.92$ vs $M_{\text{no training, reward}} = 3.91$, $F(1, 53) = .01$, not significant). Although not the significant decline in intrinsic motivation that has been reported in the creativity literature, it does little to refute this position. More important, for participants who received creativity training, the results are quite different. The provision of an extrinsic reward produces a pronounced *increase* in intrinsic motivation ($M_{\text{training, no reward}} = 3.66$ vs $M_{\text{training, reward}} = 4.34$, $F(1, 51) = 21.49$, $p < .001$). In fact, training and rewards in combination produced the highest levels of intrinsic motivation in the study by a significant margin (contrasts $M_{\text{training, reward}} = 4.34$ vs $M_{\text{no training, reward}} = 3.91$, $F(1, 53) = 6.03$, $p < .02$, $M_{\text{training, reward}} = 4.34$ vs $M_{\text{no training, no reward}} = 3.92$, $F(1, 54) = 5.93$, $p < .02$).

The provision of an external reward is accepted and interpreted differently among participants who had first received creativity training than among those who had received no such training. This finding affirms the important role of intrinsic motivation in the creative process; however, contrary to the prevailing view that extrinsic rewards necessarily undermine intrinsic motivation, our results show that extrinsic rewards can actually increase intrinsic motivation in certain conditions (i.e., when people are also given proper training).

It is worth noting the similarity of the pattern of effects between intrinsic motivation and the creativity of the new product designs. The patterns are highly consistent despite one measure (intrinsic motivation) coming from self-reports of the participants themselves, whereas the other (creativity) came from independent judges blind to conditions of the study. This separation makes it unlikely that the findings are a result of common method variance or some other study artifact.

Mediation analysis. The previous analysis examined intrinsic motivation separately from creative outcomes. However, we were also hoping to show evidence that these constructs are linked through the creative process. In other words, we were interested in investigating the set of mediated relationships within the context of the creativity training moderator. Therefore, we also conducted a multiple group analysis. This analysis involves splitting our study participants into two groups (training/no training) and then using structural equation modeling to compare the paths of extrinsic rewards to intrinsic motivation to creative outcomes between the two groups (Edwards and Lambert 2007). To avoid problems created by a high item-to-sample ratio, we first created composite indicants of our measures through a partial disaggregation confirmatory factor analysis model (Bagozzi and Heatherton 1994). The principal advantage of this technique is that it reduces the number of parameters to be estimated in the model and helps reduce measurement error.

When this analysis is undertaken, an interesting set of relationships emerges. Extrinsic rewards are positively related to intrinsic motivation, which in turn is positively linked to creative product outcomes, but only for participants who had first completed the creativity training regimen (extrinsic reward–intrinsic motivation [$\beta = 1.05$, $t = 4.54$, critical $t = 1.96$], intrinsic motivation–creative outcomes [$\beta = .47$, $t = 2.17$, critical $t = 1.96$]). Among our untrained participants, there is no relationship between extrinsic rewards, intrinsic motivation, or creative outcomes (extrinsic reward–intrinsic motivation [$\beta = -.02$, $t = -.06$, critical $t = 1.96$], intrinsic motivation–creative outcomes [$\beta = -.02$, $t = -.12$, critical $t = 1.96$], overall model fit statistics $\chi^2 = 56.37$, comparative fit index = .93, nonnormed fit index = .90, and root mean square error of approximation = .09). This additional analysis further supports our contention that extrinsic rewards can enhance creative product outcomes, but only when they are used in conjunction with appropriate training. It also supports the notion that this process flows through intrinsic motivation. It seems that the combination of training and rewards enables designers to work both smarter and harder. This is, to our knowledge, the first time creativity training, extrinsic rewards, intrinsic motivation, and creative product outcomes have all been linked simultaneously.

Discussion

In two experiments, we find that creativity training interacts with extrinsic rewards to enhance the creativity of new product outcomes This synergy exists regardless of whether the training is in the form of focused ideation production or the more generalized creative imagery technique However, the consistency of these findings raises the obvious question of whether *any* visualization might be sufficient to produce this outcome (Why go to the trouble of elaborate training regimens if one can simply have someone "imagine anything"?) Although the training techniques that we used in our studies have been developed and refined over many years, this is a legitimate question, particularly given that our control condition did not involve visualization

To address this concern, we undertook a follow-up study using newly recruited participants In this study, we used the same training procedures, same design task, and same judges as in Study 2 Because this study is focused on the nature of the training manipulation, we blocked on reward condition (i e , the reward was offered to all study participants) Otherwise, participants were randomly assigned to either the new control condition or the creativity training condition In the new control condition, instead of "doing nothing," participants completed a guided-visualization task that involved the peeling and eating of a lemon This task was sourced from a website that provides exercises to familiarize people with visualization techniques The control condition and the training condition were parallel in time taken to complete Participants who received creative visualization training exhibited significantly higher creativity in their product designs than did those who participated in a random visualization task ($M_{\text{creative visualization}} = 4$ 10, $M_{\text{control visualization}} = 3$ 66, $t(37) = 1$ 96, $p <$ 05, $n = 39$) Therefore, although there seems to be some flexibility in how the visualization training is accomplished, it must be creativity directed Any random visualization task is not sufficient to produce creative outcomes

General Discussion

Few issues are more important to the long-term success of a firm than the development of innovative new products Therefore, understanding the conditions and processes that lead to such innovations has long been a focus of marketing research Within this domain, scholarship has investigated the firm competencies and capabilities that lead to product innovation (Chandy et al 2006, Im and Workman 2004, Sethi 2000, Troy, Hirunyawipada, and Paswan 2008), the role of interfirm relationships and strategic alliances in bringing new product innovations to market (Carson 2007, Ganesan, Malter, and Rindfleisch 2005), cross-cultural influences on the NPD process (Nakata and Sivakumar 1996, Song and Parry 1997, Tellis, Prabhu, and Chandy 2009), and the role of consumers in new product innovation and diffusion (Bendapudi and Leone 2003, Fang 2008, Hoeffler 2003, Joshi and Sharma 2004, Wood and Moreau 2006) Although creativity is relevant in all of these conversations, few of these studies actively consider its role in their investigations Perhaps this neglect stems from the widespread perception of creativity as something mystical or divinely imparted rather than a normal cognitive process that can be enhanced (Sternberg and Lubart 1999, Weisberg 1993) As one of our informants explained,

> One of the reasons I think creativity is not consciously addressed and talked about in business is because of people's misunderstanding of creativity I think many see creativity as a separate segment of the population, a separate skill set Many high-performing CEOs and leaders are probably very creative, but most people label them as "intellectually brilliant" or having "good organizational skills " By not including creativity in that vocabulary, in that script, it becomes undervalued

Our research helps refute this misconception by demonstrating that creativity can be facilitated through two tools commonly at a manager's disposal incentives and training

Managerial Implications

One practical implication of our findings is that firms should do more to provide creativity training to employees Although such a recommendation may seem obvious in hindsight, a notable number of the firms in our study do not provide any type of formal creativity training for their employees (even for personnel who work in key areas such as new product design) The entirety of these firms' creative strategy entails hiring the right people and simply expecting that they will be creative Our results show that even relatively simple creative visualization exercises can pay substantial dividends in enhancing creative outcomes

Training may be for naught if it is not paired with the proper incentives, and this may be the most important insight to emerge from our research As our findings make clear, rewards and training cannot be viewed independently of each other However, all too often, managers treat them as separate issues, particularly in the case of rewards Although we now have convincing evidence that trying to use extrinsic rewards to induce creativity is more likely to produce the opposite effect (see, e g , Amabile 1996, Deci, Koestner, and Ryan 1999a), managers seem either unaware or unwilling to heed this evidence A common recommendation in the management literature, therefore, is to find ways to reduce reliance on rewards (Amabile 1998) However, our results suggest that this advice may be premature Although we acknowledge that when extrinsic rewards are offered in isolation they are likely to be counterproductive, the same cannot be said when rewards are offered in conjunction with appropriate training Offering training along with a reward stands to benefit people in two ways Not only does the training enhance capabilities, but it also shifts interpretation of the reward from some type of an enticement to an affirmation of valued contribution In short, when empowered by training, the addition of the reward raises intrinsic motivation for challenging tasks

Our findings highlight the complexities inherent in managing creativity but also the potential to leverage creativity through the careful application of common managerial tools such as incentives and training Although we consider our results encouraging, additional contextual factors are likely to moderate the effectiveness of these tools and, therefore, represent opportunities for further research

Limitations and Further Research

It is important to acknowledge the limitations of this research, all of which present opportunities for further investigation Our experimental methodology has some limits in terms of external validity We were limited in the amount of training we were able to give our research participants Although past research has shown that even limited creativity training can be beneficial (Clapham 1997, Dahl, Chattopadhyay, and Gorn 1999), more extensive training would be desirable, particularly in real industry settings Thus, we consider our findings to represent a conservative test of the benefit of combining training and reward programs

We also chose an extrinsic reward that provided a financial incentive for the designs judged as "best " Firms make use of a wide variety of extrinsic incentives including bonuses, contests, promotions, and even punitive threats to increase productivity These incentives may operate in different ways, especially in their interaction with training For example, the extrinsic reward that we used (a contest) probably induces competition among the designers to secure the prize Further research could disentangle financial and competitive incentives to better understand how the effectiveness of training can be enhanced

We also limited our experiments to a single design problem in an effort to control extraneous influences across the studies Although we believe that an improved car jack for elderly adults represents a realistic and natural type of problem that new product designers are likely to encounter, it is nonetheless a specific type of problem It would be interesting to find if our results hold for other types of NPD contexts, particularly in high-technology areas such as microchips, software development, and aerospace engineering

In addition, our research focused primarily on individual-level aspects of creativity (e g , cognitive processes, internal motivations) However, in industry, these factors will often transpire within a group context, such as part of a cross-functional team (e g , Rathnam, Mahajan, and Whinston 1995, Sethi 2000, Troy, Hirunyawipada, and Paswan 2008), which provides an opportunity to expand into new research questions Do individual motivations change when they are embedded in a group context? Does rewarding team performance alter the creative equation compared with rewarding individual initiative? How might team dynamics enhance (or attenuate) the benefits of training? The lack of answers to questions such as these highlights the need for further research to examine the role of creativity at multiple levels

Another opportunity exists to extend research into the question of outside expertise Several firms in our qualitative study outsourced a significant portion of the creative task to consultants, which raises a question If intrinsic motivation is so fundamental to this process, why do firms so readily pay someone else to produce creative ideas? Would a consultant have the same intrinsic motivation that an employee would? The simple answer would be no (Their effort is supplied in direct exchange for compensation) Consultants presumably work in creative fields because they enjoy it and so may enter the process with high levels of intrinsic motivation There has been little research that considers the influence of agent relationships such as consultants on creativity, which, again, is surprising given how prevalent this practice is in industry

Finally, our participants were engineering students who were at the beginning of their careers, therefore, their receptiveness to training and natural intrinsic motivation probably would be high Again, the finding that we still found differences actually suggests robustness in our results Nonetheless, it would be interesting to examine whether our results would replicate using a group of midcareer engineers or more senior designers The past successes and failures of these people are likely to influence both their receptiveness to training and their interpretation of incentive programs Although our studies provide a good starting point, there are many ways subsequent studies could branch out in terms of identifying further limitations and boundary conditions of this interaction

Appendix

Visualization Training

In solving design problems, many designers find that forming visual images (pictures in the mind) can help them produce innovative and effective designs One visualization strategy that has been shown to aid in the design process involves visualizing the *potential customer of the product* Seeing in your mind, a product-user being involved and interacting with a proposed product design can facilitate the development of design solutions

For many individuals, visualizing the customer is a difficult task The present training task is a guided imagery exercise that provides practice in visualizing the customer Please read through the following paragraph and attempt to visualize the images expressed After reading each sentence, close your eyes and visually process the expressed ideas and try to "see" the customer in the product usage situation

Please picture in your mind a young adult Perhaps someone that is in their early twenties Imagine that the young adult is quite thin and petite In your mind you can see them in their apartment The apartment is quite small having only a bedroom, kitchen, living room, and a bathroom Imagine the young adult coming into their living room You see that they are dragging a large box The box is obviously very heavy for the young adult and the size of it is almost overwhelming You watch as they struggle to move the box into the centre of the room After quite some time they finish positioning the box and begin to open it The thick packaging tape makes opening a difficult task You can see the young adult getting frustrated and in anger they attempt to rip at the cardboard Finally the box is open You see that in the box are the pieces to a set of new wooden TV dinner stands Dumping the contents on the living room floor, the young adult searches for the page of instructions The instruction sheet is on a small piece of cardboard and you can tell that the printing on the sheet is quite small You can tell that the young adult is having trouble reading the fine print of the instructions You watch as the young adult reaches to a nearby shelf and opens a glasses case, retrieves a pair of glasses, and then puts them on The young adult studies the instruction sheet for what seems like an eternity Finally, they put down the instructions and they begin to assemble the stand You can tell that they are confused by the instructions and the many differing types of screws, pieces of wood, and other assembly materials You watch as the young adult picks up the largest piece of wood from the floor You can tell that their small hands are obviously not large enough to hold the wood, and you watch as the heavy piece slips from their hand and crashes to the floor Leaving this scene you wonder if the new stand will ever be assembled

After completing the visualization exercise please raise your hand and the experimenter will give you the design task In the design task you will be asked to image a customer using a proposed product design We suggest that you adopt a visualization process similar to that learned in this training session Imaging a scenario that *identifies the specific characteristics of the customer as he or she interacts with the proposed design* will facilitate your ability to produce an effective and innovative design

Design Task

You are asked to develop an innovative and effective car jack design for elderly adults (age 60+) Please produce a thumbnail sketch of your design and include any brief written comments that are necessary to explain your design Please disregard any economic, material, or regulatory constraints as you develop your idea You have up to one hour to complete your design As indicated by the experimenter, please use the scrap paper for your initial sketching, and the bonded paper for your final design

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MinChung Kim & Leigh M. McAlister

Stock Market Reaction to Unexpected Growth in Marketing Expenditure: Negative for Sales Force, Contingent on Spending Level for Advertising

Because firms do not publicly report marketing expenditures, most studies of the link between firm value and marketing consider advertising (which *is* publicly reported for many firms) a proxy for marketing. The authors extend those studies in two ways. First, they broaden the proxy for marketing by considering both advertising and sales force. Second, they offer an explanation for the fact that some studies linking advertising to firm value find a positive relationship, whereas others find a negative relationship. The accounting literature suggests that the link to firm value for both unexpected growth in sales force expenditures and unexpected growth in advertising expenditures should be negative. The authors confirm the hypothesized accounting relationship for sales force expenditures but find a contingent relationship for advertising expenditures. Firm value and unexpected growth in advertising expenditures are negatively related for firms that advertise below the advertising response threshold, but they are positively related for firms that advertise above that threshold. Perhaps because this contingent relationship is difficult for analysts to learn through observation of the stock market, analysts ignore value-relevant advertising expenditure information when they forecast firm value.

Keywords: advertising, sales force, fundamental signals, analysts' forecasts, firm value, cumulative abnormal stock returns

Marketing scholars and practitioners have emphasized the importance of understanding the effect of marketing expenditure on firm value (i.e., understanding the "value relevance" of marketing) (e.g., Doyle 2000; Hanssens, Rust, and Srivastava 2009; McAlister, Srinivasan, and Kim 2007; Rust et al. 2004). The Marketing Science Institute also reports that this topic has been a top priority for senior marketing executives for more than a decade (Marketing Science Institute's Research Priorities from 1996 to 2010). In response, there have been many studies of the link between advertising and firm value, but the findings of those studies have been mixed. Some studies find a positive link between advertising and firm value, others find a negative link, and still others, an insignificant link (Conchar, Crask, and Zinkhan 2005). One contribution of this article is to help explain these seemingly conflicting findings by appealing to extant theories on advertising.

As another contribution, we note that the broad umbrella of "marketing" can include advertising, promotion, sales force, public relations, marketing research, and so on. However, most value-relevance studies in this domain restrict consideration to "advertising expenditure" (cf. Pauwels et al. [2004] and Srinivasan et al. [2009] consider the value relevance of both advertising and sales promotion expenditures for a set of automobile brands). The reason more studies have not examined the value relevance of other marketing components might be due to the difficulty of finding a large sample with firm-level data for nonadvertising components of marketing spending (Hanssens, Rust, and Srivastava 2009). To address this research gap, we gather data to estimate a firm's sales force expenditures from *Selling Power* magazine and then consider the value relevance of sales force expenditures, an important component of marketing.

For the tests of the value relevance of advertising and sales force expenditures, we represent firm value by stock returns, as has been done in a number of previous value-relevance studies. Unlike previous studies on advertising's

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value relevance, we represent advertising expenditure and sales force expenditure by a fundamental-analysis-based signal of that expenditure, that is, by the unexpected growth in that expenditure. We propose that the sign of the link between a fundamental signal and stock returns can be positive for the fundamental signal of advertising but negative for the fundamental signal of sales force. We believe that the difference in sign is driven by advertising's continuing impact on future earnings and, thereby, future cash flows (i.e., advertising's persistence effect). Furthermore, we propose that the sign of the link between stock returns and the fundamental signal of advertising is contingent on the level of a firm's advertising expenditures. Only firms with advertising expenditures above the response threshold (the spending level necessary for a sales response) will experience the benefit conveyed by advertising's persistence effect.

To test the hypotheses related to the fundamental signal of advertising, we supplement data from firms' financial reports with syndicated estimates of media spending for leading national advertisers (the 1000 firms that spend the most on advertising in a year). We confirm the hypotheses. Firms that advertise above the response threshold have a positive link between stock returns and the fundamental signal of advertising, firms that advertise below the response threshold have a negative link. Furthermore, because we consider both leading national advertisers and firms that publicly report advertising expenditure, we can make sense of seemingly conflicting results from previous studies that considered only leading national advertisers or only firms that publicly report advertising expenditures. Consistent with our hypotheses, studies that consider only leading national advertisers (firms that advertise above the advertising response threshold) find a positive link between advertising and firm value. Studies that consider only those firms that publicly report advertising spending (the majority of which, at least in our data, advertise below the advertising response threshold) typically find a negative or an insignificant link between advertising and firm value.

To test this hypothesis relating stock returns to the fundamental signal of sales force, we used *Selling Power*–based estimates of sales force spending for the 500 firms with the largest sales forces. Consistent with there being no persistence effect for sales force spending, we find a negative link between stock returns and the fundamental signal of sales force.

Given these findings, we suggest that regulators require detailed reporting of value-relevant advertising and sales force expenditures. In addition, these findings suggest that managers should maintain discipline in sales force spending and, for firms below the advertising response threshold, in advertising spending. Firms above the advertising response threshold, however, should recognize that unexpected increases in advertising spending are likely to cause an immediate boost to stock price.

Throughout this article, we use the term "marketing" generically (to represent either advertising or sales force) if there is no need to distinguish between advertising and sales force. When distinctions are important, we refer specifically to advertising or to sales force. In the next section, we detail the logic behind the proposed effects.

Theoretical Development and Hypotheses

We begin our discussion of the effects' logic by elaborating on the rationale for using unexpected growth in marketing expenditure in a test of marketing's value relevance and why accounting research suggests that unexpected growth in marketing expenditures will lead to lower-than-expected future earnings. We then explore the implications of advertising's persistence and threshold effects and present three hypotheses regarding the value relevance of unexpected growth in marketing expenditure.

Accounting Research Suggests That Unexpected Growth in Marketing Expenditures Will Lead to an Otherwise Unexpected Decrease in Future Earnings

Under the well-known efficient market hypothesis in finance, the stock market is believed to immediately incorporate all available information into the price of a firm's stock. Under the efficient market hypothesis, stock prices react only to surprises that can change investors' expectations of future cash flow (Mizik and Jacobson 2004). Consequently, a firm that increases marketing spending at the expected rate provides no surprise, it is only when a firm's marketing spending increases faster (or slower) than expected that such *unexpected* spending growth might change stock price.

To understand the impact of unexpected spending growth on stock price, consider first the impact of unexpected spending growth on sales. Unexpected growth in marketing spending in year t will be likely to increase earnings in year t, a short-term effect. In addition, unexpected growth in marketing spending in year t might also have implications for future years' earnings, a long-term effect. Virtually all empirical studies that attempt to explain stock returns (i.e., changes in stock price) include changes in earnings as one of the predictors (e.g., Ball and Brown 1968, Kothari 2001). Given this, the impact on stock returns of unexpected-growth-in-marketing-spending's short-term effect on earnings will be captured in the coefficient of earnings. Consequently, the coefficient of unexpected growth in marketing spending reports the impact on stock returns of that variable's long-term impact on earnings (Jacobson and Mizik 2009, Joshi and Hanssens 2010). That is, a positive coefficient indicates that unexpected spending growth implies an otherwise unexpected increase in future earnings and, thus, an otherwise unexpected, immediate increase in stock price. Similarly, a negative coefficient indicates that unexpected spending growth implies an otherwise unexpected decrease in future earnings and an immediate decrease in stock price.

Accounting research suggests a negative coefficient for unexpected growth in marketing expenditures in models of stock returns. The reasoning begins by noting that, though a firm's reported earnings are an important determinant of its stock price, a dollar of earnings for one firm does not necessarily create the same expectation for future cash flows that a dollar of earnings from another firm creates. Analysts believe that "signals of earnings quality," derived from operational variables, contain information about the probability that earnings will continue into the future (Lev and Thiagarajan 1993) These signals can be thought of as "vital signs" for the firm Good values for these signals indicate that the firm is more likely to be able to increase earnings, bad values indicate that the firm is less likely to be able to increase earnings The operational variables that financial analysts reportedly consider include cost items (e g , selling, general, and administrative expenses [SG&A]) and other indicators of operational efficiency (e g , inventory level, order backlog)

Again, consistent with the efficient market hypothesis, it is the unexpected growth (i e , actual minus expected) of an operational variable that will affect a firm's stock price In particular, this literature suggests that analysts interpret unexpectedly rapid growth in one of these operational variables as a signal of loss of control that is likely to reduce future earnings Testing hypotheses on the basis of that reasoning, the accounting literature shows that a firm's stock price tends to fall when an operational variable increases faster than expected (Abarbanell and Bushee 1997, 1998, Amir, Lev, and Sougiannis 2003, Covrig and Low 2005, Lev and Thiagarajan 1993)

Consequently, in the absence of countervailing forces, the stock market will interpret unexpected growth in advertising spending or unexpected growth in sales force spending as a loss of control likely to compromise future earnings, thereby causing an immediate reduction in stock price In the presence of countervailing forces, however, the stock market might draw different inferences from unexpected spending growth The two particular countervailing forces we propose are advertising's persistence effect and its threshold effect

Advertising's Persistence Effect: Unexpected Growth in Advertising Expenditures Will Lead to an Otherwise Unexpected Increase in Future Cash Flows

In addition to its short-term impact on sales, advertising has a long-term impact It is well documented in the literature that advertising aired in one period can continue to influence sales in future periods (Clarke 1976, DeKimpe and Hanssens 1995, 1999, Graham and Frankenberger 2000, Leone 1995, Little 1979) Behaviorally, advertising's persistence effect might be related to an advertisement's lingering impression in consumers' memories or to shopping habits learned during the period in which the advertisement was aired Empirically, effective advertising in one year has been shown to influence sales for as long as two years into the future, and the incremental sales in future years have been estimated to be twice the level of incremental sales generated at the time the advertisement was aired (Keller 2008, pp 238–39)

Because advertising's persistence effect has been researched at length and experienced in practice, it is reasonable to assume that the stock market is aware of this effect If the stock market interprets unexpected growth in advertising spending as a signal that the firm is going to enjoy otherwise unexpected sales in future periods because of the persistence effect, the stock market should react to unexpected growth in advertising spending in period t by increasing firm value in period t Some studies show that the stock market indeed reacts to unexpectedly high advertising spending by raising stock price (Joshi and Hanssens 2010, Srinivasan et al 2009) The findings from these studies indicate that it must be, at least for the firms they studied, that the market interprets unexpectedly high advertising spending as a harbinger of good things to come Therefore, we expect that an unexpected increase in advertising spending, even if it is not repeated in the future, can continue to yield incremental sales in the future, thus, the market will react to unexpectedly high advertising by immediately increasing firm value, at least in some cases

Whereas advertising is often characterized as providing long-term benefits, the sales force is typically characterized as providing short-term benefits (Cespedes 1995, Homburg, Jensen, and Krohmer 2008, Montgomery and Webster 1997, Rouziès et al 2005, Strahle, Spiro, and Acito 1996) The selling organization is rewarded for delivering short-term benefits that are essential to the firm's survival Because those rewards keep the selling organization focused on short-term goals, conflict can arise between marketing and sales if marketing asks sales to support strategies with long-term payoffs (Montgomery and Webster 1997) Therefore, it is not surprising that the persistence effect has not been hypothesized for sales force expenditure There is no reason to think that unexpected growth in sales force spending, when that incremental spending is not repeated in the future, will yield incremental sales in the future [1] Although advertising research has a long tradition of considering the impact of current spending on current and future sales, the sales force literature has focused on the impact of current spending on current sales This literature is particularly concerned with the effectiveness and efficiency of current sales force spending, asking how the firm can get more current sales for the current spending (e g , Horsky and Nelson 1996, Palmatier et al 2008, Rangaswamy, Sinha, and Zoltners 1990, Richards and Jones 2008) [2]

In the absence of a persistence effect for sales force spending, it is proposed that the stock market interprets unexpected growth in sales force spending (as it interprets unexpected growth in spending on other operational variables) as a cost-control issue likely to compromise future earnings Consequently, the market will react to unexpected growth in sales force spending by decreasing stock price

Summarizing these arguments, in a model of stock returns, the coefficient of unexpected growth in advertising spending or of unexpected growth in sales force spending can be interpreted as an indicator of the inference that the stock market draws (from that unexpected growth in spending) about otherwise unexpected earnings changes in the future Because the effect of advertising is likely to persist into the future, the market will, in some cases, infer that unexpected growth in advertising spending will result in otherwise unexpectedly high future earnings Because there is a lack of a persistence effect for sales force spending, the market infers that unexpected growth in sales force spending indicates a cost-control problem that will result in otherwise unexpectedly low future earnings

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[1] For example, employing incremental, temporary salespeople in period t should lead to incremental sales and earnings in period t, but it is unlikely that those incremental sales and earnings persist when the temporary salespeople depart in period t + 1

[2] Rangaswamy, Sinha, and Zoltners (1990) present a model to assist with optimizing sales force structure, and Horsky and Nelson (1996) present a model to identify potential productivity gains from an existing sales force structure Palmatier et al (2008) identify the characteristics of relationship marketing programs that make those programs efficient and effective Richards and Jones (2008) link sales force efficiency and effectiveness to customer equity (and, presumably, to firm value)

Advertising Threshold Effect: Only Firms That Advertise Above the Response Threshold Will Experience the Persistence Benefit

In the previous section, we qualified predictions about the effect of unexpected growth in advertising spending, noting that, in some cases, unexpected growth in advertising spending will have a positive coefficient in a stock return model We propose that the long-studied threshold effect for advertising (Adachi and Liu 2009, Ambler 1996, Bemmaor 1984, Corkindale and Newall 1978, Dubé, Hitsch, and Manchanda 2005, Lambin 1976, Little 1979, Vakratsas et al 2004) might determine cases in which unexpected growth in advertising spending has a positive coefficient If there is an "advertising threshold"—that is, some positive amount of advertising spending that is necessary before any sales impact can be detected (Hanssens, Parsons, and Schultz 2001)—then a firm's advertising level being above or below that threshold should influence the stock market's reaction to advertising spending

Although empirical studies of the threshold effect have focused on response to advertising for individual brands, we can think of a firm as an aggregation of its brands and project the possibility of a threshold effect for firm-level advertising spending If the stock market is aware of the existence of this firm-level advertising threshold, the stock market will only make the positive persistence-effect inferences for firms that advertise above the threshold That is, for a firm that advertises above the threshold, the stock market will infer that unexpected growth in advertising spending in period t will result (through the persistence effect) in otherwise unexpectedly high sales in future periods, which will increase the firm's value in period t For a firm that advertises below the threshold, the stock market will realize that the firm's current level of advertising is not sufficient to generate significant incremental sales in period t or in future periods Consequently, the stock market will infer that the below-advertising-threshold firm's unexpected growth in advertising spending in period t indicates a loss of cost control likely to harm future earnings, and the market will reduce the value of that below-advertising-threshold firm in period t

Consistent with this spending level–contingent effect of advertising on firm value, we note that studies examining the effect of advertising expenditure on firm value yield mixed results Conchar et al 's (2005) meta-analysis of 88 models shows that the effect of advertising expenditure on firm value ranges from –5 98 to 9 50 Researchers have explained variation in the effect of advertising expenditure on firm value according to firm size (Chauvin and Hirschey 1994, Conchar, Crask, and Zinkhan 2005, Hirschey and Spencer 1992), industry (Chauvin and Hirschey 1993, Core, Guay, and Buskirk 2003), and firm age (Core, Guay, and Buskirk 2003) We extend that literature by considering the possibility that the stock market's reaction to a firm's advertising spending might be influenced by the level of that advertising spending

Hypotheses

In summary, on the basis of the reasoning laid out previously, we present the following hypotheses regarding the value relevance of advertising expenditure and sales force expenditure Because advertising's persistence effect will only counteract the negative inferences the stock market draws from unexpected advertising spending growth for those firms that advertise above the threshold, we hypothesize the following

H_1 Beyond advertising's impact on current earnings, unexpected advertising spending growth for firms that advertise above the advertising response threshold increases stock returns

H_2 Beyond advertising's impact on current earnings, unexpected advertising spending growth for firms that advertise below the advertising response threshold decreases stock returns

Because there is no persistence effect for sales force expenditure to counteract the negative inferences the stock market draws from unexpected spending growth in sales force, we hypothesize the following

H_3 Beyond the sales force's impact on current earnings, unexpected sales force spending growth decreases stock returns

In addition to these formal hypotheses involving the stock market's reaction to unexpected spending growth, we examine two additional research questions regarding financial analysts' reactions to such unexpected spending growth It is assumed that analysts learn about the stock market's reactions by observing stock prices Accounting research documents this process (e g , Amir, Lev, and Sougiannis 2003) but also shows that analysts do not completely impound all value-relevant information contained in the fundamental signals (Abarbanell and Bushee 1997, Cheng 2005) Although an explanation for analysts' imperfect assimilation of value-relevant information is an ongoing research topic (mainly in the accounting literature), we might attribute that imperfection to differences in analysts' training, differences in their private information sets, and/or differences in their information-processing styles No matter what the explanation is for analysts' imperfect use of value-relevant information, we speculate that analysts will be more likely to use information that is easy to learn than information that is difficult to learn We also believe that it is easier to learn about the stock market's reaction to unexpected growth in sales force spending than unexpected growth in advertising spending, because the reaction to unexpected growth in sales force spending is not contingent on the level of sales force spending Thus, we expect that analysts' forecasts will incorporate value-relevant information from unexpected growth in sales force spending but will not capture value-relevant information from unexpected growth in advertising spending

Variables in the Models

To test hypotheses and investigate research questions, we develop cross-sectional time-series regression models In this section, we develop the variables to be used in those models We begin by extending accounting-based fundamental signals to create fundamental signals related to marketing Next, we explain the dependent variable for testing hypotheses (annual cumulative abnormal stock returns) and the dependent variable for testing analysts' reaction to the fundamental signals of marketing (unexpected change in the analysts' forecasts of firm value) We then introduce other predictor variables used in the models

Focal Predictor Variable: Fundamental Signal of Marketing ($S_{marketing}$)[3]

To structure appropriate marketing-related predictor variables for the tests of our hypotheses, we turn to fundamental analysis, a method of security valuation that involves examining a firm's earnings, sales, assets, expenses, and so on Fundamental analysis is an important and basic tool that investors use to assess a firm's financial health as they look for under- and overvalued stocks For example, Lev and Thiagarajan (1993) find that financial analysts, who might be a representative group of investors, rely on financial ratio-based fundamental analysis when they value a firm Lev and Thiagarajan (1993) and Abarbanell and Bushee (1998) show that the application of fundamental analysis yields significant abnormal stock returns Kothari (2001) notes that one of the principal sources of demand for capital markets research is "fundamental analysis and valuation "

Notably, no previous studies have investigated the value relevance of a fundamental signal of marketing ($S_{marketing}$)—a signal derived by fundamental analysis on marketing information We extend the accounting literature that models stock returns by including (1) a fundamental signal of advertising ($S_{advertising}$) and (2) a fundamental signal of sales force ($S_{sales\ force}$) in the model of firm value

An important assumption underlying the fundamental signals introduced by the fundamental-analysis literature is that operational variables are expected to change at the same rate as a firm's sales That is, if the firm's sales are increasing (or decreasing), these operational variables are expected to increase (or decrease) at the same rate We follow the convention by assuming that investors expect an annual percentage change in marketing expenditures to equal the annual percentage change in sales Thus, we construct $S_{marketing}$ for a firm i in year t with the following formula[4]

$$S_{marketing} = \Delta Marketing_{it} - \Delta Sales_{it},$$

where

$\Delta Marketing_{it} = (Marketing_{it} - \overline{Marketing_{it}})/\overline{Marketing_{it}}$,

$\Delta Sales_{it} = (Sales_{it} - \overline{Sales_{it}})/\overline{Sales_{it}}$,

$\overline{Marketing_{it}} = (Marketing_{it-1} + Marketing_{it-2})/2$,

$\overline{Sales_{it}} = (Sales_{it-1} + Sales_{it-2})/2$,

$Marketing_{it}$ = firm i's spending on marketing in year t (i e , firm i's spending on advertising or its spending on sales force in year t), and

$Sales_{it}$ = firm i's sales in year t

Dependent Variable for Testing the Value Relevance of the Fundamental Signals of Marketing: Cumulative Abnormal Stock Returns (CAR)

Following precedent in the literature (Abarbanell and Bushee 1997, Amir et al 2003, Covrig and Low 2005, Lev and Thiagarajan 1993), to test H_1–H_3, we define firm value as annual cumulative abnormal stock return (CAR), which is the sum of 12 monthly abnormal returns for the firm (for the details of return accumulation periods, see the Appendix) Firm i's abnormal return in month m (AR_{im}) is that firm's actual return in month m minus its expected return in month m The actual monthly return for a firm i in month m, obtained from the Center for Research on Security Prices (CRSP), is $R_{im} = \ln[(D_{im} + P_{im})/P_{im-1}]$, where D_{im} is the cash dividend payable on firm i's common stock in month m, P_{im} is the closing price of firm i's common stock at the end of month m, and P_{im-1} is firm i's closing price at the end of month m – 1, and prices are adjusted for capital changes such as stock splits and stock dividends

To estimate firm i's expected return in month m of a fiscal year t, we follow convention and first estimate a market-level model of stock returns by using historical data (60 months before the beginning of fiscal year t) and using Carhart's (1997) four-factor model

$$R_{im} = R_{fm} + \beta_{1i}(R_{mm} - R_{fm}) + \beta_{2i}SMB_m + \beta_{3i}HML_m + \beta_{4i}UMD_m + \varepsilon_{im},$$

where i indexes the firm and m indexes the month,

$R_{im} = \ln[(D_{im} + P_{im})/P_{im-1}]$ = *ex post* rate of return for stock i during month m,

$R_{mm} = \ln(L_{im}/L_{im-1})$ = an index of the *ex post* value-weighted return for all New York Stock Exchange firms during month m (i e , the market rate of return), in which L_{im} is the Fisher's link relative, a market price index of all firms on the New York Stock Exchange at month m,

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[3]Traditionally, accounting research has shown that "accounting" is not limited to the role as a channel of information delivery Managerial accounting research streams have focused on identifying accounting information that drives "firm value" and measuring value drivers (Ittner and Larcker 2001) Lev and Thiagarajan (1993), on whose work we based our research, is one example of identifying and measuring potential value drivers on the basis of accounting information and of showing that some of the "signals" they identified are indeed "value drivers " Thus, if one of the proposed fundamental marketing signals is shown to be related to stock returns, then the fundamental signal will be a value driver Because we build our model from the work of Lev and Thiagarajan (1993), we use their naming convention (i e , fundamental signal)

[4]We note that other authors, using monthly media spending and a narrow set of companies, construct more elaborate, time-series models of the expected level of marketing spending (e g , Joshi and Hanssens 2010, Srinivasan et al 2009) If similarly detailed data on marketing spending ever become available for the broad cross-section of publicly traded firms, a time-series-based expectation could be built into these fundamental signals of marketing At this point, with annually reported advertising and sales force data, there are too few observations of marketing spending to effectively estimate a time-series-based expectation of marketing spending

R_{fm} = risk-free return at month m (one-month Treasury bill return rate from Ibbotson Associates),

SMB_m = stock return from value-weighted portfolio of small stocks minus stock return from value-weighted portfolio of big stocks for month m (from French's website[5]),

HML_m = stock return from value-weighted portfolio of high book-to-market ratio firms minus stock return from value-weighted portfolio of low book-to-market ratio firms for month m (from French's website),

UMD_m = average return on two high previous return portfolios minus the average return on two low previous return portfolios for month m (from French's website), and

$\varepsilon_{im} \sim$ i i d $N(0, \sigma^2)$

We then predict firm i's return for the 12 months in the fiscal year t under consideration by using the estimated coefficients $(\hat{\beta}_{i1}, \hat{\beta}_{i2}, \hat{\beta}_{i3}, \hat{\beta}_{i4})$ and published values of SMB_m, HML_m, and UMD_m Thus, firm i's expected return $(\bar{R}_{im})$ for a month m in a fiscal year t is $\bar{R}_{im} = R_{fm} + \hat{\beta}_{1i}(R_{mm} - R_{fm}) + \hat{\beta}_{2i}SMB_m + \hat{\beta}_{3i}HML_m + \hat{\beta}_{4i}UMD_m$, and abnormal, or unexpected, return (AR_{im}) for firm i during month m is $AR_{im} = R_{im} - \bar{R}_{im}$ Thus, firm i's annual CAR in a year t (CAR_{it}) is $CAR_{it} = \Sigma_{m=1}^{12} AR_{im}$

Dependent Variable for Testing Analysts' Reaction to Fundamental Signals of Marketing: Unexpected Change in Analysts' Forecasts of Firm Value (d_PVE)

Theoretically, a firm's value is the discounted future cash flows projected by the stock market Similarly, the discounted future earnings forecasts made by analysts can be considered a measure of analysts' prediction of firm value Following Amir et al (2003), who created a discounted future earnings forecast measure of analysts' forecasts of firm value, we use the discounted sum of five years of consensus earnings forecasts (median of earnings forecasts from all analysts covering a particular firm) and expected future dividends as the present value of future earnings forecasts (PVE) (for more details, see the Appendix) Rather than considering PVE directly, we use as the dependent variable the "unexpected change in analysts' forecasts," d_PVE_{it} $[= (PVE_{it} - PVE_{it-1})/P_{it-1}]$, where PVE_{it-1} represents the expected forecast for firm i at t, and P_{it-1} is the closing price of firm i at the end of t – 1 (Amir et al 2003)

Control Variables

In addition to using $S_{marketing}$ as the focal predictor variable, we include predictor variables typically found in models of CAR

Change in earnings per share (d_EPS) Because a firm's earnings are closely related to firm value (e g , Ball and Brown 1968, Kothari 2001), we include "change in earnings per share," d_EPS, as a predictor in the models of CAR (Abarbanell and Bushee 1997, Amir et al 2003) It is also useful to note that marketing spending in period t will affect earnings in period t, thus, the coefficient of d_EPS will capture the unexpected-growth-in-marketing spending's short-term impact on stock returns through changes in contemporaneous or same-period earnings Consequently, the coefficient of the fundamental signal of marketing will reflect the long-term impact of marketing spending (i e , period t marketing spending's impact on future cash flows)

Other fundamental signals We consider nine fundamental signals proposed by Lev and Thiagarajan (1993) as additional control variables in our stock return model[6] That is, fundamental signals used as control variables are fundamental signals related to inventory (S_{INV}), accounts receivable (S_{AR}), gross margin (S_{GM}), capital expenditure (S_{CAPX}), effective tax rate (ETR), labor force (LF), audit quality (AQ), inventory system (FI), and selling, general, and administrative spending ($S_{SG\&A}$) Because we go beyond published studies to include $S_{advertising}$ and $S_{sales\ force}$, and advertising and sales force spending are included in SG&A according to COMPUSTAT's definition of SG&A, we modify $S_{SG\&A}$ to avoid double-counting marketing expenditure We break SG&A into the focal variable (advertising or sales force expenditure) and partial SG&A (PSG&A), which is SG&A minus the focal variable That is, we construct a fundamental signal of PSG&A ($S_{PSG\&A}$) on the basis of SG&A excluding the focal variable in each model (advertising expenditure for H_1 and H_2 and sales force expenditure for H_3) and use $S_{PSG\&A}$ as a control variable instead of $S_{SG\&A}$ We summarize all predictor variables in Table 1

Data

To calculate the dependent variable CAR (i e , "firm value"), we retrieved 60 monthly stock returns from CRSP To calculate control variables (i e , nonmarketing fundamental signals and d_EPS), we use financial report data from COMPUSTAT To calculate d_PVE (i e , unexpected change in analysts' forecast of firm value), we use consensus analysts' forecasts of earnings for five years into the future from Institutional Brokers' Estimate System (I/B/E/S)

For focal marketing variables, we draw two estimates For both advertising and sales force, we take a first estimate

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[5] See http //mba tuck dartmouth edu/pages/faculty/ken french/data_library html (accessed August 18, 2009)

[6] Lev and Thiagarajan (1993) originally proposed 12 fundamental signals However, because of many missing firm-year observations for some of the fundamental signals, they focused on 9 of them to expand their sample size Follow-up studies also did not consider all of the 12 fundamental signals Abarbanell and Bushee (1997) use 9 fundamental signals Amir et al (2003) include only 5 fundamental signals in their stock return models Cheng (2005) include the 7 fundamental signals with coefficients that had been found significant in the previous studies Thus, we include the 9 most frequently used of Lev and Thiagarajan's fundamental signals in our stock return (CAR) model

TABLE 1
Variable Operationalization

Variable	Description	Operational Construct[a]	Data Elements in COMPUSTAT and Data for Focal Marketing Variables
S_{ADV_C}	Fundamental signal of advertising (for nonleading national advertiser firms)	ΔAdvertising$_t$ – ΔSales$_t$	Sales = Data12 Advertising = Data45 (= ADV$_C$)
S_{ADV_L}	Fundamental signal of advertising (for leading national advertiser firms)	ΔAdvertising$_t$ – ΔSales$_t$	Advertising = ADV$_L$
S_{SF_S}	Fundamental signal of sales force	ΔSales force$_t$ – ΔSales$_t$	Sales force = SF$_S$
S_{INV}	Fundamental signal of inventory	ΔInventory$_t$ – ΔSales$_t$	Inventory = Data78 or Data3
S_{GM}	Fundamental signal of gross margin	ΔSales$_t$ – ΔGross margin$_t$	Gross margin = Data12 –Data41
S_{AR}	Fundamental signal of accounts receivable	ΔAccounts receivable$_t$ – ΔSales$_t$	Accounts receivable = Data2
$S_{PSG\&A}$	Fundamental signal of partial SG&A	ΔPSG&A$_t$ – ΔSales$_t$	PSG&A (partial SG&A) = Data189 – focal marketing variable (ADV$_C$ or ADV$_L$ or SF$_S$)
S_{CAPX}	Fundamental signal of capital expenditure	ΔIndustry capital expenditures$_t$ – ΔCapital expenditures$_t$	Capital expenditure = Data30
ETR	Effective tax rate	$[(1/3\Sigma_{\tau=1}^{3} ETR_{t-\tau}) - ETR_t] \times (EPS_t - EPS_{t-1})$, where ETR_t = Tax expense$_t$/Earnings before taxes$_t$	Earnings per share (EPS) = Data58 Tax expense = Data16 Earnings before interest and taxes = Data170 + Data65
LF	Labor force	$1 - [(Sales_t/Employee_t)/(Sales_{t-1}/Employee_{t-1})]$	Employee (number of employees) = Data29
AQ	Audit quality	0 for unqualified, 1 for qualified or other	Audit qualification = Data49
FI	FIFO indicator	0 for LIFO, 1 for FIFO or other[b]	LIFO or FIFO = Data59
d_EPS	Change in EPS	$(EPS_t - EPS_{t-1})/P_{t-1}$	P_t (closing stock price at the end of year t) = Data199

[a]ΔX_t is defined as $(X_t - \bar{X}_t)/\bar{X}_t$, where $\bar{X}_t$ is $(X_{t-2} + X_{t-1})/2$
[b]FIFO = first in, first out, and LIFO = last in, first out

of a firm's spending from COMPUSTAT Publicly reported "advertising and promotion" expense (Data45 in COMPUSTAT) provides the first estimate of a firm's advertising spending, ADV$_C$ In practice, this quantity is known to cover whatever expenses a particular firm decides are appropriate to report as advertising and promotional expense From a regulator's perspective, what has been considered important is that the firm uses a consistent definition of advertising and promotion expense through time Little effort has been made to ensure the use of a consistent definition of advertising and promotion expense across companies Consequently, differences in the definition across firms might make ADV$_C$ a "noisy" indicator of a firm's advertising expense in cross-sectional models

To approximate a firm's sales force expenditure, we build from publicly reported SG&A (Data189 in COMPUSTAT) Although some nonselling SG&A expenses are identified in COMPUSTAT (e g , advertising expense, research-and-development expense), and therefore can be removed from SG&A, other nonselling expenses (e g , accounting department expenses, human resources department expenses) are not identified and cannot be removed to isolate sales force expenditure from SG&A Given that the level of nonselling SG&A expense is likely to differ across firms, the resulting estimate of sales force expense based on COMPUSTAT, SF$_C$, might be a noisy indicator of sales force expenditure in cross-sectional models

We take a second estimate of a firm's advertising spending from a data syndicator and note that previous value-relevance researchers have considered syndicated estimates of firms' advertising expenditures (e g , Joshi and Hansssens 2010, Rao, Agarwal, and Dahlohoff 2004, Srinivasan et al 2009) In our case, we take the estimate of firm-level advertising spending each year from 1980 to 2005 from TNS Media Intelligence (TNS) [7] TNS approximates the amount that a firm spends on broadcast, print, Internet, and outdoor advertising in a given year and then reports that approximated expenditure for the 1000 advertisers who spend the most in the year (i e , leading national advertisers in the year) Because the method used to create this estimate is the same across firms, we expect the advertising expenditure reported by TNS, ADV$_L$, to be a less noisy predictor than ADV$_C$ in cross-sectional models

We take a second estimate of sales force spending from *Selling Power* magazine Each year from 1998 to 2005, *Selling Power* reported the approximate sales force size for the firms with the 500 largest sales forces We approximate a firm's sales force spending by multiplying its sales force size times the average annual fully burdened cost of a salesperson We denote this estimate of sales force expenditure as SF_S Because the method used to create this estimate is the same across firms, we expect SF_S to be a less noisy predictor than SF_C in cross-sectional models

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[7] The data vendor (TNS) was named Competitive Media Reporting (CMR) before 2000 and Leading National Advertisers (LNA) before 1992 In 2008, the TNS group was acquired by Kantar Media

Samples Differ Across Data Sources

We have three sources of data for our measures of marketing expenditure COMPUSTAT, TNS, and *Selling Power* magazine If it were the case that the different data sources provided marketing information on the same set of firms, analysis would be relatively straightforward However, as Figure 1 illustrates, different data sources cover different firms Considering the years 1998–2005, of our 17,077 firm-year observations, only 512 (3%) of the observations include marketing measures from all three data sources [8]

This means that models addressing the effects of advertising will be estimated with one set of firms (Circles A and C in Figure 1), whereas models addressing the effects of sales force spending will be estimated with a different set of firms (Circle B in Figure 1) In addition, to test H_1 and H_2, we need to distinguish between the set of firms with advertising levels above the advertising response threshold and the set of firms with advertising levels below the threshold

Distinguishing Between Above- and Below-Threshold Firms

To distinguish between above- and below-threshold firms, we assume that the firms that TNS identifies as "leading national advertisers" (i e , firms in Circle A of Figure 1) are those that are advertising above the threshold, and firms that publicly report "advertising and promotion" but are not "leading national advertisers" (i e , firms in Regions 5 and 7 of Figure 1) are advertising below the threshold If, as we hypothesize, there is a positive relationship between advertising and firm value for firms above the advertising threshold and a negative relationship for firms below the advertising threshold, then previous studies can be thought of as supporting this operationalization of the advertising response threshold All previous studies that restricted attention to firms that are "leading national advertisers" have found the hypothesized positive link between advertising and firm value (Hirschey 1982, 1985, Hirschey and Weygandt 1985, Joshi and Hanssens 2010, Luo and Donthu 2006, Rao, Agarwal, and Dalhoff 2004, Srinivasan et al 2009) Furthermore, studies performed with the broader set of firms included in COMPUSTAT (i e , firms in Circle C in Figure 1) found the link between advertising and firm value to be positive (Cheng and Chen 1997, Graham and Frankenberger 2000), insignificant (Barth, Clement, Foster, and Kasznik 1998, Erickson and Jacobson 1992), and negative (Bublitz and Ettredge 1989) The seemingly conflicting findings in this second set of studies might have resulted because different studies drew different mixes of firms above the threshold (i e , firms in Regions 2 and 6 of Figure 1, hypothesized to have a positive link between advertising and firm value) and firms below the threshold (i e , firms in Regions 5 and 7 of Figure 1, hypothesized to have a negative link between advertising and firm value)

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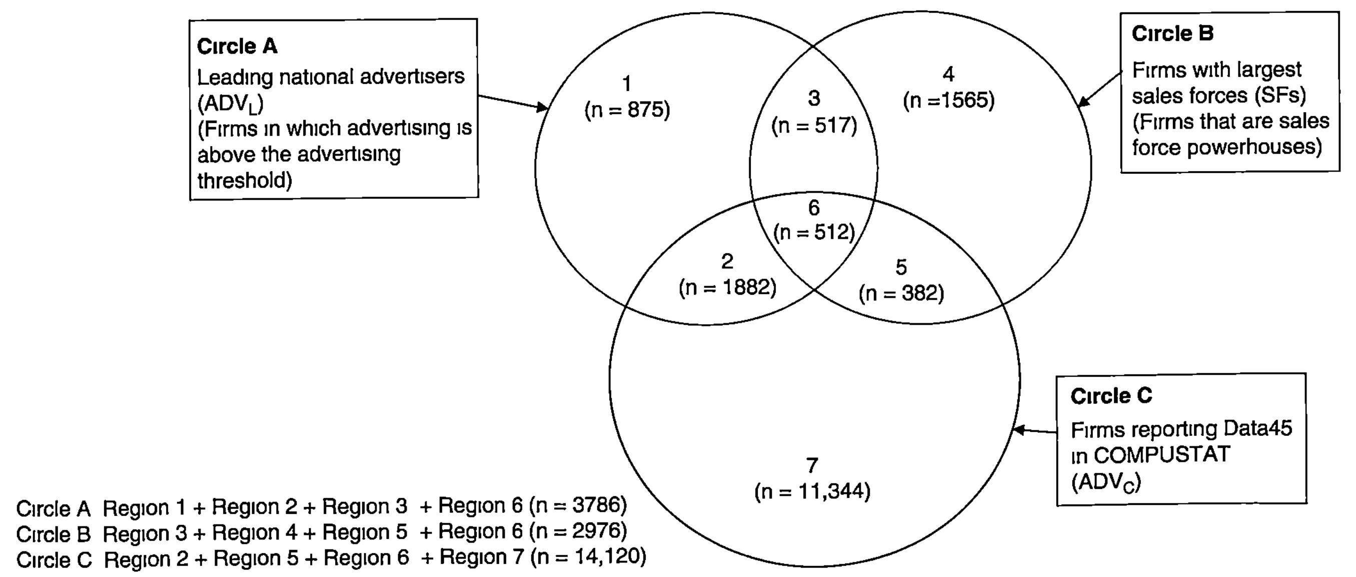
[8] Note that because regulators do not require firms to report ADV_C, the set of firms that do report ADV_C differs substantially from the set of firms that are the top 1000 advertisers from TNS (i e , leading national advertisers) Among the leading national advertisers, 37% do not report ADV_C Among those firm-year observations for which ADV_C is reported, 83% are not leading national advertisers In summary, many of the leading national advertisers do not consistently report ADV_C, and the majority of the firm-year observations that do report ADV_C are for firms that are not leading national advertisers

FIGURE 1
Venn Diagram for the Sample Structure, 1998–2005


Circle A
Leading national advertisers (ADV_L)
(Firms in which advertising is above the advertising threshold)
Circle B
Firms with largest sales forces (SFs)
(Firms that are sales force powerhouses)
Circle C
Firms reporting Data45 in COMPUSTAT (ADV_C)
1 (n = 875)
2 (n = 1882)
3 (n = 517)
4 (n =1565)
5 (n = 382)
6 (n = 512)
7 (n = 11,344)
Circle A Region 1 + Region 2 + Region 3 + Region 6 (n = 3786)
Circle B Region 3 + Region 4 + Region 5 + Region 6 (n = 2976)
Circle C Region 2 + Region 5 + Region 6 + Region 7 (n = 14,120)

Notes The number in parentheses indicates the number of firm-year observations for a region

Estimation and Testing Strategy

In the primary analyses that follow, we focus on three effects: (1) the impact of a fundamental signal of ADV_L (S_{ADV_L}) on firm value for firms that advertise above the advertising threshold (those that are leading national advertisers [Circle A in Figure 1]), (2) the impact of a fundamental signal of ADV_C (S_{ADV_C}) on firm value for firms with advertising spending below the advertising threshold (firms that report ADV_C but are not leading national advertisers [Region 5 and 7 in Figure 1]), and (3) the impact of a fundamental signal of SF_S (S_{SF_S}) on firm value for firms that are among *Selling Power*'s 500 largest sales forces (Circle B in Figure 1).

Although we believe that our primary models provide the best tests of the hypotheses given the sample structure depicted in Figure 1, we estimated additional models to ensure robustness of the results. In the first robustness check, we include all marketing predictor variables and use all sample observations, setting missing observations of the focal variables (S_{ADV_L}, S_{ADV_C}, and S_{SF_S}) to zero. In the second robustness check, we ask whether the effects detailed in H_1 and H_2 are driven by the sample of firms (leading national advertisers vs. other advertisers) or by the measure of advertising spending (ADV_L vs. ADV_C). Finally, we relate sales force spending to firm value for non–*Selling Power* firms (Regions 2 and 7 in Figure 1) and ask whether the resulting effect differs from the effect estimated for *Selling Power* firms.

Models

We note that the data are an unbalanced panel with repeated observations for a firm, and so we adapt the traditional accounting models (e.g., Lev and Thiagarajan 1993) to include firm-specific effects, annual dummies, and a correction for serial correlation when needed (Baltagi and Wu 1999; Bhargava, Franzini, and Narendranathan 1982; Wooldridge 2002). Thus, our models to test our formal hypotheses and analysts' reactions to $S_{marketing}$ (i.e., $S_{advertising}$, $S_{sales\ force}$) have the following structure:

$$(1)\quad CAR_{it} = \alpha_1 + v_{1i} + \beta_1 M^1_{it} + \xi_1 X_{it} + \gamma_1 d\_EPS_{it} + \varepsilon_{1it},$$

$$(2)\quad d\_PVE_{it} = \alpha_2 + v_{2i} + \beta_2 M^2_{it} + \xi_2 X_{it} + \gamma_2 d\_EPS_{it} + \varepsilon_{2it},$$

where i indexes firms and t indexes years,

M^1_{it} = $S_{advertising}$ (for H_1 and H_2), $S_{sales\ force}$ (for H_3),

M^2_{it} = $S_{advertising}$ (for testing analysts' reaction to advertising spending), $S_{sales\ force}$ (for testing analysts' reaction to sales force spending),

X_{it} = S_{INV}, S_{AR}, S_{GM}, $S_{PSG\&A}$, S_{CAPX}, ETR, LF, AQ, FI, year dummies,

v_{ji} ($j = 1, 2$) = fixed effects for a firm i, and

ε_{jit} ($j = 1, 2$) = $\rho\varepsilon_{jit-1} + \eta_{jit}$ [$|\rho| < 1$, $\eta_{jit} \sim$ i.i.d. $N(0, \sigma^2_{j\eta})$] (only when serial correlation tests reject the null hypothesis of no first-order autocorrelation of errors).[9]

Results

The first three columns of Table 2 report estimation results for the time-series, cross-sectional models relating a fundamental signal of marketing expenditure to firm value (Equation 1).[10] The first column of Table 2 shows that for above-advertising-threshold firms (Circle A in Figure 1), the coefficient for S_{ADV_L} is significant and positive in the model of CAR ($b = .02$, $p < .05$), consistent with H_1. The second column shows that for below-advertising-threshold firms (Regions 5 and 7 in Figure 1), the coefficient of S_{ADV_C} is significant and negative in the model of CAR ($b = -.02$, $p < .05$), in support of H_2. The third column indicates that for *Selling Power* firms (Circle B in Figure 1), S_{SF_S} is significant and negative in the model of CAR ($b = -.08$, $p < .01$), consistent with H_3. Taken together, these results are consistent with our hypotheses. For firms above the advertising threshold, the market interprets advertising expenditure that is increasing faster than expected as an indication that the firm is poised to grow, and the market therefore increases stock price. For firms below the advertising threshold, the market interprets advertising expenditure increasing faster than expected as a signal of loss of cost control that is likely to compromise future earnings, and the market therefore decreases stock price. The market interprets sales force expenditure that is increasing faster than expected as a signal of loss of cost control that is likely to compromise future earnings and thus decreases stock price.

The last three columns of Table 2 address questions regarding the extent to which financial analysts understand the value relevance of the proposed marketing fundamental signals. Columns 4 and 5 show that value-relevant S_{ADV_L} is not significantly related to d_PVE for above-advertising-threshold firms ($-.01 < b < 0$, $p > .10$, Column 4), and value-relevant S_{ADV_C} is not significantly related to d_PVE for below-advertising-threshold firms ($-.01 < b < 0$, $p > .10$, Column 5). Column 6 indicates that S_{SF_S}, however, is significantly, negatively related to d_PVE ($b = -.05$, $p < .05$). Consistent with our expectations, these results suggest that financial analysts do not impound value-relevant information from

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[9] To reduce the potential influence of outliers, for each variable in Equations 1 and 2, we eliminate the largest and the smallest 1% of values.

[10] Replacing $S_{SG\&A}$ with $S_{PSG\&A}$ and $S_{marketing}$ could pose two problems for our models. (Note that PSG&A is "SG&A – ADV_L" for firms in region 1 of Figure 1, "SG&A – ADV_C" for firms in regions 2 and 7, "SG&A – ADV_C – SF_S" for firms in regions 5 and 6, "SG&A – ADV_L – SF_S" for firms in region 3, and "SG&A – ADV_L" for firms in region 2.) First, if marketing expenditures were the primary driver of variation in SG&A, removal of marketing expenditures from SG&A might leave $S_{PSG\&A}$ as a poor proxy for $S_{SG\&A}$. Second, if marketing spending were highly correlated with other costs captured in SG&A, the two new variables ($S_{marketing}$ and $S_{PSG\&A}$) would be highly correlated, and interpretation of those variables' parameter estimates would be clouded by problems of multicollinearity. We address these concerns by considering the correlations calculated with our data. The correlations between $S_{SG\&A}$ and $S_{marketing}$ are .12, .26, and .32 for $S_{marketing}$ (= S_{ADV_L}, S_{ADV_C}, and S_{SF_S}), indicating that marketing is not the primary driver of variation in SG&A. The correlations between $S_{SG\&A}$ and $S_{PSG\&A}$ are .77, .64, and .60 for the three samples underlying primary analyses, indicating that $S_{PSG\&A}$ is a reasonable proxy for $S_{SG\&A}$. We also find that the correlations between $S_{marketing}$ and $S_{PSG\&A}$ are .13, .39, and .20, for $S_{marketing}$ (= S_{ADV_L}, S_{ADV_C}, and S_{SF_S}), indicating that $S_{marketing}$ and $S_{PSG\&A}$ move relatively independently. We expect that the relationship between these two variables will not hamper interpretation of their parameter estimates.

TABLE 2
The Impact of Fundamental Signals of Marketing (S_{ADV_L}, S_{ADV_C}, and S_{SF_S}) on CAR and Change in Analysts' Forecasts of Firm Value

	Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**	**Column 6**
Sample (Regions of the Venn Diagram in Figure 1 Included in Analysis)	**Firms Above the Advertising Threshold (Circle A)**	**Firms Below the Advertising Threshold (Regions 5 and 7)**	**Firms with Largest Sales Force (Circle B)**	**Firms Above the Advertising Threshold (Circle A)**	**Firms Below the Advertising Threshold (Regions 5 and 7)**	**Firms with Largest Sales Force (Circle B)**
Dependent variable	CAR	CAR	CAR	d_PVE	d_PVE	d_PVE
Focal independent variable	S_{ADV_L}	S_{ADV_C}	S_{SF_S}	S_{ADV_L}	S_{ADV_C}	S_{SF_S}
Intercept	06 (02)***	39 (31)	– 02 (03)	– 00 (01)	02 (02)	06 (03)*
Fundamental Signals of Marketing						
S_{ADV_L} (advertising from leading national advertisers ADV_L)	02 (01)**	—	—	– 00 (01)	—	—
S_{ADV_C} (advertising from COMPUSTAT ADV_C)	—	– 02 (01)**	—	—	– 00 (01)	—
S_{SF_S} (sales force from *Selling Power* SF_S)	—	—	– 08 (03)***	—	—	– 05 (02)**
Changes in Earnings per Share						
d_EPS	19 (02)***	26 (02)***	19 (05)***	40 (02)***	40 (02)***	69 (04)***
Other Fundamental Signal Predictor Variables						
S_{INV} (inventory)	– 03 (01)***	– 03 (01)***	– 01 (01)	– 00 (01)	01 (00)***	– 01 (01)
S_{AR} (accounts receivable)	– 00 (01)	00 (01)	– 00 (03)	00 (01)	01 (01)**	06 (03)**
S_{GM} (gross margin)	01 (02)	– 05 (02)***	– 14 (05)***	– 05 (01)***	– 01 (01)*	– 13 (04)***
S_{PSGA} (SG&A – ADV_C or ADV_L or SF_S)	– 07 (02)***	– 04 (02)*	01 (03)	– 06 (01)**	– 08 (01)***	– 03 (02)
S_{CAPX} (capital expenditures)	02 (00)***	01 (00)	03 (02)*	– 01 (00)***	– 01 (00)***	02 (01)
LF (labor force)	– 04 (02)**	– 00 (02)	– 11 (04)***	– 03 (01)***	– 01 (01)	– 14 (03)***
ETR (effective tax rate)[a]	33 (16)**	32 (24)	02 (42)	13 (10)	06 (16)	– 01 (31)
AQ (audit quality)	00 (01)	– 02 (01)	– 00 (02)	00 (01)	– 03 (01)***	02 (02)
FI (inventory system)	– 01 (01)	03 (03)	01 (02)	– 00 (01)	– 02 (01)*	– 07 (04)*
Overall R^2 (within R^2)	06 (06)	06 (06)	07 (08)	15 (12)	11 (11)	26 (36)
Number of firms (observations)	747 (5706)	2163 (8760)	265 (1197)	747 (5706)	2163 (8760)	265 (1197)

*$p < 1$

**$p < 05$

***$p < 01$

[a] ETR was industry-averaged based on two-digit Standard Industrial Classification codes

Notes Coefficients (standard errors) are in the columns We do not report estimated coefficients for year dummies unexpected growth in advertising spending in their forecasts of firm value, perhaps because the effect of unexpected growth in advertising spending is contingent on the level of that spending, which makes it difficult for analysts to learn this relationship. Notably, analysts do impound value-relevant information from unexpected growth in sales force spending, perhaps because the effect of unexpected growth in sales force spending on firm value does not depend on the level of that spending, which makes it easy for analysts to learn this relationship.

Robustness of the Results

Table 3 reports models estimated to check the robustness of our findings. We first consider the simultaneous estimation of all effects. Next, we ask whether the observed advertising threshold effect is driven by the difference between leading national advertisers and other advertisers or by the difference in the measures of advertising spending we have for those two sets of firms. For sales force spending, we ask whether the observed link between sales force spending and firm value holds for non–*Selling Power* firms. We then discuss the impact on results of changing the functional form of dependent variables.

Simultaneous estimation of all the effects. The first two columns of Table 3 report our first robustness check: a model that simultaneously estimates effects for all marketing signals on firm value (Column 1) and a model that simultaneously estimates marketing signals' effects on analysts' predictions of firm value (Column 2). That is, we include all the signals (S_{ADV_L}, S_{ADV_C}, and S_{SF_S}) in Equations 1 and 2 as independent variables. To be able to use all firm-year observations, we replace any missing values of S_{ADV_L}, S_{ADV_C}, or S_{SF_S} with zero. Thus, we estimate Equations 1 and 2, with M^1_{it}, M^2_{it}, = S_{ADV_L}, S_{ADV_C}, and S_{SF_S}. Because S_{ADV_L} is only available for leading national advertisers, we take its coefficient to be an indication of the effect of advertising on firm value for firms above the advertising threshold. Because the majority of the observations of S_{ADV_C} are for nonleading advertisers, we take its coefficient to be an indication of the effect of advertising on firm value for firms below the advertising threshold.

From Column 1, we observe that S_{ADV_L} is a significant and positive predictor of firm value ($b = .02, p < .05$) and S_{ADV_C} is a significant and negative predictor of firm value ($b = -.02, p < .01$), consistent with H_1 and H_2. However, the coefficient for S_{SF_S} is insignificant ($b = -.05$, $p > .10$), inconsistent with H_3, possibly because values of S_{SF_S} are unavailable before 1998, which indicates that this signal was artificially set to zero for approximately more than two-thirds of the observations in this robustness check model.

From Column 2, we observe that S_{SF_S} is marginally significant ($b = -.05$, $p < .10$), but neither of the proposed advertising signals (S_{ADV_C} and S_{ADV_L}) is a significant predictor of analysts' forecasts of firm value. Insignificant coefficients ($0 < b < .01, p > .10, -.01 < b < 0, p > .10$) for the two fundamental signals of advertising (S_{ADV_C} and S_{ADV_L}) are consistent with analysts finding it difficult to learn about the link between advertising and firm value, because that link is contingent on the level of advertising spending. That the estimated coefficient for S_{SF_S} is marginally significant, even though two-thirds of the observations of S_{SF_S} were replaced by zero, adds further support to our conjecture that analysts incorporate sales force spending information in their forecasts.

Difference in sign of advertising's effect because of sample or measure? As a second robustness check, we consider whether the observed threshold effect (i.e., the advertising-level-contingent difference in the sign associated with the unexpected-growth-in-advertising-spending's impact on firm value) is driven by the set of firms considered (leading national advertisers vs. other advertisers) or by the measure of advertising expenditure used (ADV_L vs. ADV_C). We examine this question in two ways. First, we examine all firms reporting ADV_C (i.e., at all firms in Circle C, Figure 1). If the observed threshold effect is largely driven by differences between leading national advertisers and other advertisers, the response to S_{ADV_C} should differ for the leading national advertisers versus other advertisers. We then narrow our focus to leading national advertisers in that set (i.e., to firms in Regions 2 and 6, Figure 1) and compare two models. In the first model, we represent advertising by S_{ADV_C}, in the second model, we represent advertising by S_{ADV_L}. If the observed threshold effect is largely driven by the difference between leading national advertisers and other advertisers, H_1 suggests that advertising (S_{ADV_C}, S_{ADV_L}) will have a positive significant coefficient in both models.

For our first take on this robustness check (Table 3, Column 3), we consider all firms reporting S_{ADV_C} and create a dummy variable identifying the leading national advertisers in that set (i.e., identifying firms in Regions 2 and 6 of Figure 1). The model we estimate represents advertising by S_{ADV_C} and expands Equation 1 by including an interaction between the new dummy variable and S_{ADV_C}. On the basis of S_{ADV_L}'s positive and significant coefficient in our primary analyses (Column 1 of Table 2), we would expect a positive coefficient for the interaction term (S_{ADV_C} times the dummy for leading national advertisers). From the third column of Table 3, however, we observe that the interaction term is not statistically significant ($-.01 < b < 0, p > .10$). The lack of a significant and positive coefficient for the interaction in this model is consistent with the advertising measure (ADV_C vs. ADV_L) influencing the estimated effect of unexpected growth in advertising spending.

For our second take on this robustness check (Table 3, Columns 4 and 5), we consider only the leading national advertisers that report ADV_C (i.e., firms in Regions 2 and 6 of Figure 1). When we estimate advertising's effect using S_{ADV_L} (Column 5), we observe the expected significant and positive effect ($b = .03, p < .01$). When we estimate advertising's effect using S_{ADV_C} (Column 4), we observe an insignificant effect ($b = -.01$, $p > .10$), which provides another illustration of the influence of the measure of advertising used on estimated coefficients.

Perhaps it is not surprising that the choice between S_{ADV_L} and S_{ADV_C} influences the results of statistical tests. As we pointed out previously, regulators require a firm to define ADV_C (firm-reported advertising spending) consistently across time. However, regulators have made little effort to ensure consistency in the operationalization of ADV_C across firms. All observations of ADV_L, however, are

TABLE 3

The Impact of Fundamental Signals of Marketing (S_{ADV_L}, S_{ADV_C}, S_{SF_C}, and S_{SF_S}) on CAR and Change in Analysts' Forecasts of Firm Value: Results for Robustness Checks

	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Types of Robustness Checks	**Simultaneous Estimation of All Effects**		**Threshold Effect Attributable to Sample or Measure?**			**Sales Force Effect for Non-*Selling Power* Firms?**
Sample (Regions of the Venn Diagram in Figure 1 Included in Analysis)	**All Firms (All Regions)**		**Firms with ADV_C (Circle C)**	**Firms with ADV_C and ADV_L (Regions 2 and 6)**		**Non-*Selling Power* Firms with ADV_C (Regions 2 and 7)**
Dependent variable	CAR	d_PVE	CAR	CAR	CAR	CAR
Focal independent variable	S_{ADV_C}, S_{ADV_L}, S_{SF_S}	S_{ADV_C}, S_{ADV_L}, S_{SF_S}	S_{ADV_C}	S_{ADV_C}	S_{ADV_L}	S_{SF_C}
Intercept	00 (01)	– 02 (01)*	31 (26)	09 (02)***	08 (02)***	27 (28)
Fundamental Signals of Marketing						
S_{ADV_L} (advertising from leading national advertisers ADV_L)	02 (01)**	– 00 (01)	—	—	03 (01)***	—
S_{ADV_C} (advertising from COMPUSTAT ADV_C)	– 02 (01)***	00 (00)	– 02 (01)**	– 01 (01)	—	– 02 (01)**
S_{SF_S} (sales force from *Selling Power* SF_S)	– 05 (03)	– 05 (03)*	—	—	—	—
S_{SF_C} (sales force from COMPUSTAT SF_C)	—	—	—	—	—	– 06 (02)**
S_{ADV_C} × LNA_DUM (dummy for leading national advertising firms)	—	—	– 00 (02)	—	—	—
Changes in Earnings per Share						
d_EPS	27 (01)***	42 (01)***	24 (02)***	18 (03)***	18 (03)***	24 (02)***
Other Fundamental Signal Predictor Variables						
S_{INV} (inventory)	– 02 (00)***	00 (00)	– 02 (01)***	– 02 (01)***	– 02 (01)***	– 02 (01)***
S_{AR} (accounts receivable)	02 (00)***	03 (00)***	01 (01)	01 (01)	00 (01)	01 (01)
S_{GM} (gross margin)	– 03 (00)***	– 03 (00)***	– 06 (02)***	– 03 (02)	– 03 (02)	– 06 (01)***
S_{PSGA} (SG&A – ADV_C or ADV_L or SF_S)	– 08 (01)***	– 12 (01)***	– 04 (02)**	– 19 (03)***	– 21 (03)***	—
S_{CAPX} (capital expenditures)	02 (00)***	– 01 (00)***	01 (00)**	02 (00)***	01 (00)***	01 (00)**
LF (labor force)	02 (01)***	01 (01)	– 01 (02)	– 03 (02)	– 03 (02)*	– 01 (02)
ETR (effective tax rate)[a]	10 (09)	16 (08)**	37 (16)**	34 (19)*	35 (19)*	38 (17)**
AQ (audit quality)	– 00 (01)	– 03 (00)***	– 01 (01)	00 (01)	00 (01)	– 01 (01)
FI (Inventory System)	01 (01)	– 01 (00)***	00 (02)	– 02 (01)	– 02 (01)	01 (02)
Overall R^2 (within R^2)	06 (06)	12 (11)	05 (05)	07 (07)	08 (07)	06 (05)
Number of firms (observations)	5319 (35,818)	5319 (35,818)	2510 (12,924)	621 (4162)	621 (4162)	2468 (12,469)

*$p < 1$
**$p < 05$
***$p < 01$
[a] ETR was industry-averaged based on two-digit Standard Industrial Classification
Notes Coefficients (standard errors) are in the columns

created by a single data syndicator, which causes that measure to be defined more consistently across firms Given that ADV_C is likely to be a noisier measure than ADV_L, these robustness-check findings are not too surprising Our first take on this question suggests that we cannot observe a difference in advertising response for leading national advertisers versus other advertisers when using a noisy S_{ADV_C} Our second take suggests that advertising's positive effect for leading national advertisers, observable when using S_{ADV_L}, is not observable when using a noisy S_{ADV_C}

It is important to note, however, that these robustness-check results are not inconsistent with the hypothesized threshold effect being driven by differences between leading national advertisers and other advertisers Comparing the main model relating S_{ADV_C} to firm value for nonleading advertisers (Column 2 in Table 2) to the robustnesscheck model relating S_{ADV_C} to firm value for leading national advertisers (Column 4 in Table 3), we observe a difference in the effects for the two sets of firms The effect of S_{ADV_C} is significantly negative for nonleading national advertisers, and it is insignificant for leading national advertisers

In summary, we conclude that it is more difficult to observe the positive link between advertising and firm value when using the noisier estimate of a firm's advertising spending, ADV_C, but the observed threshold effect does not seem to be driven by differences between ADV_C and ADV_L Rather, considering all the evidence, the results are consistent with the notion that that response to unexpected growth in advertising spending is more positive for leading national advertisers than for other advertisers

*Sales force effect holds for non–*Selling Power *firms?* To allow for the possibility that the impact of sales force expenditure on firm value is different for non–*Selling Power* firms than for *Selling Power* firms, we complement Table 2's primary analysis relating SF_S to stock returns for *Selling Power* firms (Circle B in Figure 1) with a separate model relating a COMPUSTAT-based estimate of sales force spending to stock returns for non–*Selling Power* firms (Regions 2 and 7 in Figure 1) As our COMPUSTAT-based estimate of sales force spending, we take PSG&A, which is measured by $SG\&A - ADV_C$ (Table 1), and we refer to this COMPUSTAT-based estimate of sales force spending as SF_C

We find a significant and negative coefficient for S_{SF_C} when the model is estimated on non–*Selling Power* firms ($b = -06$, $p < 05$, see Column 6 in Table 3) This shows that the sign of the sales force spending effect does not depend on whether a firm is included in *Selling Power*'s list of the 500 largest sales forces

Alternative measures of firm value (CAR) and analysts' prediction of firm value (d_PVE) For the firm value model, we considered alternative measures of CAR That is, we reestimated Equation 1 using a measure of CAR based on the three-factor model (Fama and French 1993), and the results remain consistent with our hypotheses We also considered alternative measures of analysts' prediction of firm value (d_PVE) We reestimated the analysts' forecasts model (Equation 2) using d_PVE calculated with the average, instead of the median, as the consensus forecast and found that the results were still consistent with hypotheses In addition, we reestimated the analysts' forecasts model (Equation 2) using individual-level analyst forecasts rather than consensus forecasts and, again, found that the results did not change The results of these robustness checks suggest that any aggregation bias that might be induced by constructing a consensus forecast does not drive our findings

Discussion

The questions of whether and how marketing spending might be related to firm value remain a high priority for marketing executives and researchers We shed some light on these questions by relating "fundamental signals" of advertising and sales force to stock returns by using a broad multi-industry sample of publicly traded firms over a long period of time

Key Findings

Our results show that, beyond the stock market's reaction to unexpected-growth-in-advertising-spending's short-term impact on contemporaneous earnings, the stock market reacts positively to unexpected growth in advertising spending for firms with spending above the advertising response threshold We argue that the positive coefficient for these above-response-threshold firms arises because of advertising's persistence effect Advertising in one period is expected to result in incremental sales in future periods For firms that advertise below the advertising response threshold, the stock market expects no persistence effect and therefore reacts negatively to unexpected growth in advertising spending

No matter what the level of a firm's sales force expenditure, the stock market reacts negatively to unexpected growth in sales force spending Rather than interpreting unexpected growth in sales force spending as a signal of increased investment in customer acquisition and retention capability likely to yield incremental profit in future periods, the market seems to interpret the unexpected spending increase as an indication of loss of cost control that is likely to compromise future earnings Perhaps the stock market perceives advertising productivity as essentially fixed, whereas it perceives sales force productivity as increasing over time If this were the case, marked sales growth, which could require an increase in the level of advertising expenditure, might be achievable with the current level of sales force expenditure because the sales force is expected to become more productive

Previous value-relevance studies tested the impact of advertising on firm value by using either (1) data syndicators' estimates of firms' advertising expenditures for a narrow set of firms that spend the most on advertising or (2) publicly reported advertising expenditures for the broader set of firms that report advertising expenditure We go further by considering both the narrow set of high advertising firms and the broad set of firms that publicly report advertising spending and by considering both a data syndicator's estimate of firms' advertising expenditures and firms' publicly reported advertising expenditures

Consideration of both the narrow and the broad set of firms allows us to shed light on the mixed findings regarding the relationship between advertising spending and firm value Previous studies that restricted attention to firms that have high advertising expenditure have found a positive relationship between unexpected advertising spending and firm value We confirm those findings with our analysis of leading national advertisers in H_1 For firms with the highest levels of advertising spending (i e , firms classified as above-threshold advertising spenders), the stock market reacts positively to an unexpected increase in advertising spending Previous studies that considered the broad set of firms that publicly report advertising expenditure have found positive, negative, and insignificant relationships between advertising and firm value H_2 predicts that for firms that publicly report advertising expenditure but are not leading national advertisers, the stock market reacts negatively to an unexpected increase in advertising spending We conjecture that the mixed results in previous studies that have used this broad set of publicly reporting firms might have been seen because those studies examined different mixes of firms with higher and lower advertising spending It is useful to note that previous studies that attempted to explain these mixed results have found that firm size influences the sign of the relationship between advertising and firm value (Chauvin and Hirschey 1994, Hirschey and Spencer 1992) Because advertising level and firm size are positively correlated, the finding that firm size is related to the sign of the impact of advertising on firm value can be explained by the advertising response threshold effect underlying H_1 and H_2

Consideration of two measures of advertising expenditure (a data syndicator's estimates of firms' advertising expenditures and firms' publicly reported advertising expenditures) suggests that cross-firm variation in the definition of "advertising expenditure" probably makes the firm-reported measure of advertising expenditure noisier than the data syndicator's measure Although tests based on the two measures do not tell completely different stories, in a robustness check we found that (holding sample firms constant) the use of syndicated advertising spending data enabled us to identify an effect that was masked when we used firm-reported advertising spending data

As another contribution, this study is, to the best of our knowledge, the first to examine the relationship between sales force spending and firm value, even though the sales force is an important component of the broader "marketing" function, especially for business-to-business firms Beyond any stock market reaction to the short-term impact on earnings of a sales force increase, we find that the stock market reacts negatively to unexpected growth in sales force expenditure Consistent with the notion that the marketing literature posits no persistence effect for sales force expenditure, the stock market interprets unexpected growth of sales force expenditure as an indication of loss of cost control that is likely to compromise future earnings

The particular functional form with which we choose to represent marketing expenditure in stock return models might also be viewed as a contribution to the marketing literature This functional form has at least two virtues First, the structure can be considered reasonable because it is the functional form that financial analysts use to represent the impact of an operational variable on firm value Second, because it is the functional form used by analysts, the fundamental signal structure might give the results of this study further credibility with a possibly skeptical financial community

Investigation of analysts' reactions to value-relevant marketing signals, handled as an empirical question, proved interesting The results show that analysts do react to value-relevant information about unexpected growth in sales force expenditure, but they do not react to value-relevant information about unexpected growth in advertising expenditure We conjecture that this is because the link between unexpected growth in advertising expenditure and firm value is contingent on the level of advertising spending, which makes this relationship more difficult for analysts to learn by observation of the stock market Because the link between unexpected growth in sales force expenditure and firm value is not contingent on the level of sales force expenditure, it is easier for analysts to learn Consistent with the notion that a noncontingent relationship is easier to learn, Luo, Homburg, and Wieseke (2010) show that an increase in consumer satisfaction index causes analysts' forecasts to increase

Public Policy and Managerial Implications

This article has public policy implications Our finding that detailed marketing expenditure data are value relevant underscores the need for bodies such as the Financial Accounting Standards Board and the Securities and Exchange Commission to require detailed marketing expenditure data in publicly released financial statements As Figure 1 shows, many firms, even many leading national advertisers, do not currently report advertising spending in their financial statements In addition, value-relevant sales force spending data are not easily isolated in firms' financial statements In addition to requiring disclosure, regulators should clearly define the items a firm should include in advertising expenditure, sales force expenditure, and so on, so that analysts and investors can make more accurate cross-company comparisons of marketing spending

Another implication of these results is that all firms must maintain vigilance in controlling sales force costs, and low-advertising firms must remain vigilant in controlling advertising costs The stock market expects these costs to grow at the same rate as sales and will punish firms that allow these expenses to grow faster than expected For high advertising firms, the stock market rewards advertising spending that grows faster than expected A high advertising firm poised to launch a great new product can ramp up advertising spending with the expectation that the stock market will interpret that escalating spending as a harbinger of good things to come

It is important to note that a negative coefficient for a fundamental signal of marketing does not mean that marketing spending should be cut (or increased more slowly than expected) As the coefficients in Table 2 demonstrate, the impact of earnings on firm value is greater than the impact of any of the fundamental marketing signals Because a cut in advertising or sales force might lead to an immediate drop in sales (and therefore in contemporaneous earnings), the firm-value benefit from decreasing the fundamental signal of marketing would be swamped by the firm-value cost of the related reduction in earnings.

We also note that the positive coefficient for the fundamental signal of advertising for leading national advertisers should not be interpreted as suggesting that those firms should spend infinitely on advertising. To achieve the persistence effect, the advertising must be effective. It should include information that makes the brand more valuable to customers. Presumably, brand managers only increase advertising spending faster than expected when they have "news" that should make the brand even more valuable in future periods (e.g., a new product, a valuable new characteristic added to an existing product). If the firm has no "news," it presumably will not accelerate advertising spending.

Similarly, our results should not be interpreted as implying that a nonleading advertiser should suddenly lift advertising spending to the level of spending for leading national advertisers without reorganizing and resetting firm strategy. It is probably the case that nonleading advertisers are organized to make money by emphasizing some function other than advertising (Homburg, Jensen, and Krohmer 2008; Landry, Tipping, and Kumar 2006). Without making a strategic change in the organizational structure that would enable the firm to exploit the value that advertising can create, even a significant increase in advertising spending is unlikely to drastically change such a nonleading advertiser's performance.

Limitations and Further Research

If it is the case that a firm's advertising spending level provides insight into the firm's strategic focus, further research to explore this link might use complementary data collection methods (e.g., in-depth interviews, surveys, field studies). If we understood how to measure marketing's centrality to a firm's strategy, further research could explore the extent to which marketing's strategic centrality influences the effectiveness of marketing expenditures, as suggested by Kohli and Deshpandé (2005).

Looking even more broadly, the current economic turbulence might be of a magnitude not seen during our 26-year period of observation (1980–2005). If that is the case, researchers might need to explore the implications of heightened turbulence. A recent *Wall Street Journal* article (July 26, 2010) titled "Investors Say No to 'Let's Expand' Companies" might imply that the stock market is reinterpreting signals formerly thought to foreshadow future earnings growth. If this is the case, increasing advertising faster than expected might be interpreted negatively by the stock market, even for leading national advertisers.

Alternative explanations for the positive link between advertising spending and firm value for leading national advertisers posited in previous studies are spillover and signaling effects (summarized in Joshi and Hanssens 2010). The spillover effect indicates that advertising increases the stock market's familiarity with the firm, thereby increasing stock ownership, liquidity, and firm value (Frieder and Subrahmanyam 2005; Huberman 2001; Joshi and Hanssens 2010). The signaling effect indicates that advertising spending can be a signal of financial well-being or competitive viability (e.g., Joshi and Hanssens 2010). Further research might consider the relevance of those explanations for firms that spend less on advertising. Should spillover and signaling be expected to have threshold effects? If not, how can the negative link between unexpected growth in advertising expenditures and firm value for lower-advertising firms be explained? Regarding the signaling explanation, how can the negative link between unexpected growth in sales force expenditure and firm value be explained? Is it the case that unexpected growth in advertising spending, but not unexpected growth in sales force spending, signals firm financial well-being or competitive viability? If so, why?

Another path for future work is to consider whether marketing-related information might improve the accuracy of financial analysts' forecasts. Although analysts' forecasts have been shown to incorporate value-relevant information on unexpected growth in sales force expenditures and on customer satisfaction (Luo, Homburg, and Wieseke 2010), analysts seem to miss the value-relevant information in a firm's unexpected growth in advertising expenditures. Because financial analysts are important information intermediaries in the security market, Hanssens, Rust, and Srivastava (2009) argue that it is important that analysts fully understand the value relevance of all marketing information.

In summary, we hope this article provides both academic and practitioner marketers with a tool to use as they try to make the importance of marketing salient to their financial colleagues and to stock market participants.

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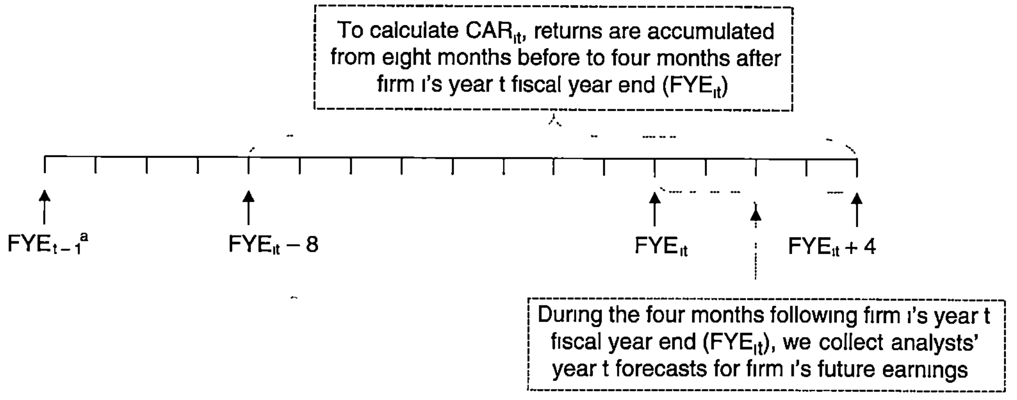
Appendix

Calculation of CAR and Changes in Analysts' Forecasts of Firm Value (d_PVE)

Time Frame for the Calculations of CAR and D_PVE



To calculate CAR_{it}, returns are accumulated from eight months before to four months after firm i's year t fiscal year end (FYE_{it})

During the four months following firm i's year t fiscal year end (FYE_{it}), we collect analysts' year t forecasts for firm i's future earnings

[a]FYE_{it} is fiscal year end for firm i in year t $FYE_{it} - 8$ is eight months before the FYE_{it} and $FYE_{it} + 4$ is four months after the FYE_{it}

Return Accumulation Periods and Annual CAR

Because firms typically issue their annual reports a few months after a fiscal year's end, it is the custom in the accounting and finance literature to assume that annual reports are issued sometime between fiscal year end and four months after the fiscal year end Because we want our measure for the value of firm i in year t (CAR_{it}) to reflect information from the annual report that firm i issued at the end of year t – 1, we begin the accumulation period four months after the end of i's fiscal year t – 1 (which is eight months before the end of i's fiscal year t, $FYE_{it} - 8$) Thus, CAR_{it} is measured as the sum of monthly abnormal stock returns (i e , the sum of $AR_{im} = R_{im} - \bar{R}_{im}$, in which R_{im} is the actual and $\bar{R}_{im}$ is the expected return for month m) from eight months before to four months after the end of firm i's fiscal year t (from $FYE_{it} - 8$ to $FYE_{it} + 4$), to which we refer as the "return accumulation periods " Thus, the annual cumulative abnormal stock return, CAR_{it}, for a firm i in year t is measured as

$$CAR_{it} = \sum_{m' = FYEit - 8}^{FYEit + 4} (R_{im'} - \bar{R}_{im'})$$

Analysts' Forecasts: The Present Value of Future Earnings Forecasts (PVE).

The procedure to calculate PVE for a firm i at year t is summarized as follows

$$PVE_{it} = \left\{ \sum_{t'=1}^{5} \left[(FEPS_{it+t'} + D_{it}) / \rho_{it}^{t'} \right] \right\} / P_{it-1},$$

in which $FEPS_{it+t'}$ ($t' = 1, 2, \quad , 5$) are consensus median forecasts of earnings (reported by I/B/E/S) for the years (t + 1, t + 2, , t + 5) made most recently between FYE_t and $FYE_t + 4$, P_{it-1} is the closing price at the end of year t – 1, and D_{it} is the dividend (DATA26 in COMPUSTAT) at year t, and $\rho_{it} = 1 + R_{Ft} + (.03)\beta_{it}$, ρ_{it} is the discount factor for firm i in year t, R_{Ft} is the risk-free rate in year t, and β_{it} is the systematic risk of the firm i (for the details of the discount rate, ρ_{it}, see Amir et al 2003)

We selected median forecasts (FEPS) for five consecutive years that were released most recently before the end of the return accumulation periods ($FYE_{it} + 4$) Using median forecasts made most recently between FYE_{it} and $FYE_{it} + 4$, we ensured that the information from annual financial statements for year $t - 1$ was available to financial analysts In the case of missing forecasts for any of the subsequent five years, we replaced the missing forecast with the forecast of earnings for the previous year multiplied by a five-year earnings growth rate forecast that is also available from I/B/E/S For example, if the EPS forecast for t + 3 ($FEPS_{t+3}$) is missing but there exists the earnings growth rate (g), we replaced the missing $FEPS_{t+3}$ with $FEPS_{t+2}(1 + g)$, following Amir et al (2003)

We also combined the consensus forecasts of earnings for each year in the future with the expected future dividend, D_{it}, assuming that the expected future dividend is the same as the current dividend (Amir et al 2003) Then, the present value of future earnings forecasts for firm i in year t was determined by discounting the forecasted future earnings plus expected future dividends, with the firm's cost of capital, ρ_{it}, thus, the discounted sum is $\Sigma_{t'=1}^{5}[(FEPS_{it+t'} + D_{it})/\rho_{it}^{t'}]$ Finally, the present value (PVE) is deflated by share price at the end of the fiscal year $t - 1$ (P_{it-1})

Henrik Hagtvedt

The Impact of Incomplete Typeface Logos on Perceptions of the Firm

This research investigates the influence of incomplete typeface logos on consumer perceptions of the firm In these logos, parts of the characters in the company name are intentionally missing or blanked out, giving rise to a form of perceptual ambiguity Three studies demonstrate that although incomplete typeface logos have an unfavorable influence on perceived firm trustworthiness, they have a favorable influence on perceived firm innovativeness The former influence is tied to the logo's perceived clarity, while the latter influence is tied to its perceived interestingness Furthermore, incomplete typeface logos have an unfavorable influence on overall attitude toward the firm, but only for consumers with a prevention, rather than promotion, focus These findings suggest that firms should avoid incomplete typeface logos if perceptions of trustworthiness are critical or if consumers are likely to have a prevention focus However, such logos may be successfully employed with promotion-focused consumers, and they may be used as a tool to position a firm as innovative

Keywords logo, ambiguity, innovativeness, trustworthiness, firm, consumer perceptions

In the IBM logo, there are blank stripes across the letters, as if parts of the characters are missing This deliberate incompleteness creates a form of perceptual ambiguity, and it is not rare to see this type of ambiguity incorporated into logos However, what influence do such incomplete typeface logos have on consumer perceptions of the firm?

Logos are ubiquitous in the marketplace, and the average consumer encounters a multitude of them on any given day These logos are valuable company assets that firms spend a great deal of time and money promoting Indeed, many firms spend substantially more on permanent media such as logos than on other forms of marketing communication (Henderson and Cote 1998) But what influence does the logo in turn have on consumer perceptions of the firm? This is an important question, not only because it represents a gap in the marketing literature and in the understanding of how consumers interpret visual stimuli but also because of the vast amounts of resources that firms expend on logos as a marketing tool Research in marketing has begun to illuminate the influences that various logos have on consumers (Henderson and Cote 1998, Henderson, Giese, and Cote 2004, Janiszewski and Meyvis 2001) The current research contributes to this stream by investigating the influence of incomplete typeface logos, which constitute a form of perceptual ambiguity, on consumer perceptions of the firm

More broadly speaking, both marketing textbooks and common sense suggest obvious potential benefits of promoting an unambiguous corporate and brand image Consumers can thus have a clear understanding of what the firm represents Nonetheless, marketers provide consumers with a great deal of ambiguous information through, for example, product advertisements (Pieters, Wedel, and Batra 2010), product names (Miller and Kahn 2005), ad photos (Peracchio and Meyers-Levy 1994), and logos (Henderson and Cote 1998) There seems to be a common notion that ambiguity may somehow be useful, otherwise, it would not be so frequently employed as a device in marketing communications The current research proposes one potential goal that may be achieved through the perceptual ambiguity of incomplete typeface logos, namely, the positioning of a firm as innovative in consumers' eyes This is because the incomplete logo is perceived as interesting and creative, and this perception spills over onto the firm However, a potential drawback of this practice is also uncovered The incompleteness conveys a lack of clarity, leading to diminished perceptions of trustworthiness Finally, regulatory focus is shown to moderate the influence of incomplete typeface logos on overall attitude toward the firm Incompleteness has an unfavorable influence on attitude toward the firm for consumers with a prevention focus but not for those with a promotion focus

Three studies are presented to empirically investigate these notions The empirical findings presented not only extend previous findings in logo-related research (Henderson and Cote 1998, Henderson, Giese, and Cote 2004, Janiszewski and Meyvis 2001, Van der Lans et al 2009) but also contribute to research on visual communication in general (Lurie and Mason 2007, Pieters, Wedel, and Batra 2010) and ambiguity specifically (Miller and Kahn 2005, Peracchio and Meyers-Levy 1994, Yi 1990) Furthermore, the theory and findings establish connections between these literatures and a nascent stream of art-related research (Hagtvedt and Patrick 2008, Joy and Sherry 2003), as well as a broader stream of research in aesthetics (Bloch, Brunel, and Arnold 2003, Hirschman 1983) Key managerial take-

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aways include the implications that firms should avoid incomplete typeface logos if perceptions of trustworthiness are critical or consumers are likely to have a prevention focus However, such logos may be successfully employed with promotion-focused consumers, and they may be used as a tool to position a firm as innovative

Logos, Ambiguity, and Perceptions of the Firm

Ambiguity in Marketing

A widely held belief among marketers and scholars is that good logos should readily evoke the same intended meaning across consumers (Henderson and Cote 1998) Indeed, it is a common notion that, in general, marketing stimuli should communicate one clear message that is difficult to misinterpret (Keller 1993) This implies that logos, and any form of marketing communication, should be unambiguous

Nonetheless, extant literature has provided examples of ambiguity that gives rise to favorable consumer responses For example, Miller and Kahn (2005) demonstrate that consumers react favorably to products with ambiguous color or flavor names because they expect marketing messages to convey useful information If the marketing information provided is ambiguous or uninformative, consumers attempt to fill in the blanks by searching for an explanation This search in itself leads to favorable perceptions of the product In the realm of ad photos, Peracchio and Meyers-Levy (1994) argue that the perceptual ambiguity stemming from a cropped or incomplete object prompts people to seek closure by supplying the missing part This perceptual act leads to enhanced product evaluations by stimulating positive affect

Perceptual Ambiguity in Logos

How, then, might the perceptual ambiguity of a logo influence consumer perceptions of the firm? To answer this question, it must be clarified what is intended by these terms The word "logo" encompasses diverse graphic and typeface elements, but the current research is restricted to typeface logos that represent the firm's name Moreover, for the sake of clarity and consistency, only one basis for perceptual ambiguity was chosen, namely, incompleteness In other words, the logo is styled such that parts of the characters in the company name appear to be missing or blanked out and must therefore be filled in by the consumer through a perceptual act Thus, the perceptual ambiguity consists of the two or more simultaneously feasible interpretations of the visual stimulus, that is, blank spaces or implied continuations of the logo characters

Perceptual Ambiguity and Perceptions of the Firm: Innovativeness and Trustworthiness

The drive to mentally complete a visual stimulus may be potent, as indicated by research that has demonstrated consumers' desire to resolve perceptual ambiguities stemming from cropped images (Peracchio and Meyers-Levy 1994) Indeed, artists often stimulate this drive when using incompleteness as a device in the creation of interesting images For example, in line drawing, an artist might leave parts of the lines unfinished so that the eye of the viewer has something to complete In visually interesting drawings, or ones that stimulate and are appreciated by the viewer, the blank spaces are often as expressive as the actual lines

Previous research has extensively documented the power of perceptual ambiguity to stimulate interest in terms of physical, intellectual, and emotional response Long and Toppino (2004, p 748) discuss a popular argument among visual theorists that "ambiguity is the hallmark of the retinal stimulus in nearly all visual perception and that the visual system must routinely resolve the ambiguity for the organism's effective adaptation to its environment " Berlyne (1971, p 156) illuminates the "arousal-raising possibilities of patterns that can have several alternative continuations and thus induce two or more divergent lines of expectation or hypothesis," referring also to the theory that ambiguity causes content to become poetic through the process of recreation Indeed, Zeki (2001) describes the unfinished sculptures of Michelangelo, stressing how much of their appeal lies in the need for spectators to mentally complete them This, he says, "is only qualitatively different from finished works with the inestimable quality of ambiguity—a characteristic of all great art" (p 52)

Drawing on these perspectives, this study theorizes that incomplete typeface logos spark interest and that, in line with extant research (Hagtvedt, Hagtvedt, and Patrick 2008), visual interestingness encourages the perception of creativity In terms of how consumers view the firm represented by that logo, it is expected that this translates into the perception of firm creativity Indeed, the marketing literature is replete with documented spillover effects of various types (Balachander and Ghose 2003) Given the function of a logo as a visual representation of the firm, it seems reasonable that perceptions of the logo would subsequently spill over onto the firm itself Furthermore, similar to how artistic innovation is rooted in individual creativity, innovativeness is another word that might be used to describe a firm's creative output Indeed, a creative firm meets the changing needs of consumers by delivering highly innovative products (Im and Workman 2004) The preceding arguments can be formally stated as follows

H_1 An incomplete (vs complete) typeface logo causes consumers to perceive the firm as more (vs less) creative and innovative

H_2 This influence is mediated by the perceived interestingness of the logo

However, as Henderson, Giese, and Cote (2004) assert, a given logo is unlikely to engender only a single response Thus, a possible unfavorable influence of incomplete typeface logos is also theorized because ambiguity entails uncertainty and a lack of clarity (Peracchio and Meyers-Levy 1994, Sawyer 1992, Singh 1993) Communication influences perceptions of trust and trustworthiness, which, in the context of a firm, are conceptually linked to the reliability of that firm (Morgan and Hunt 1994), and thus unclear communications may adversely influence the perceived trustworthiness and reliability of the communicator (Vignovic and Thompson 2010, Yakovleva, Reilly, and Werko 2004) Although it might be obvious that some types of vague or seemingly deceptive communication would influence this perception, it is less obvious that lack of logo clarity would do so. However, prior research has demonstrated this influence even with visual stimuli that do not seem to give rational grounds for it. For example, Gorn, Jiang, and Johar (2008) demonstrate that something as seemingly irrelevant as a chief executive officer that has a "baby face" influences perceptions of his or her trustworthiness. Thus, it is hypothesized that a logo with low clarity or readability has an adverse influence on perceived firm trustworthiness. Formally,

H_3: An incomplete (vs. complete) typeface logo causes consumers to perceive the firm as less (vs. more) trustworthy and reliable.

H_4: This influence is mediated by the perceived clarity of the logo.

Attitude Toward the Firm: The Moderating Role of Regulatory Focus

According to the previously explained theories, incomplete typeface logos may have both a favorable and an unfavorable influence on consumers' attitude toward the firm. Although innovation may sometimes give rise to mixed emotional responses from consumers (Wood and Moreau 2006), in general, it is viewed favorably, as is further evidenced by the contribution it makes to increased firm value (Sorescu and Spanjol 2008). However, the importance of trust and trustworthiness for a firm's success is also well documented, and some researchers even argue that trust is "the single most powerful relationship marketing tool available to a company" (Berry 1996, p. 42; Sirdeshmukh, Singh, and Sabol 2002). In addition, there may be other perceptions than those pertaining to innovativeness and trustworthiness that are influenced by incomplete typeface logos. Thus, it is unclear whether such logos have a favorable or unfavorable influence on consumers' overall attitude toward the firm. Indeed, the current study theorizes that the influence of incomplete typeface logos on this attitude depends on the consumer's regulatory focus.

Regulatory focus theory (Higgins 1997; Wan, Hong, and Sternthal 2009) indicates that people with a promotion focus are concerned with opportunities, openness to change, and the maximization of accomplishments and positive outcomes, whereas those with a prevention focus are concerned with safety, preference for stability, and the minimization of errors and negative outcomes. Therefore, there is reason to expect that consumers with a prevention focus will view perceptual ambiguity unfavorably. In contrast, this should not necessarily be the case for consumers with a promotion focus. Ambiguity connotes uncertainty (Singh 1993); on the one hand, uncertainty signals risk, but on the other hand, uncertainty may also signal opportunity. Although this connection is perhaps less obvious, it may be enough to counteract the unfavorable influence of risk, at least for consumers with a promotion focus, because they are not as concerned with risk avoidance as consumers with a prevention focus. The ambiguity here does not involve uncertainty about the strategy, operations, or economic viability of a firm but only the immediacy and straightforwardness with which a logo may be interpreted. However, in line with the preceding discussion, given the extent to which a logo is perceived as representative of a firm, it is expected that this perceptual ambiguity will unfavorably influence attitude toward the firm for consumers with a prevention focus. Formally,

H_5: For consumers with a prevention focus, an incomplete typeface logo gives rise to a less favorable attitude toward the firm than does a complete typeface logo. This is not the case for consumers with a promotion focus.

Empirical Overview

As outlined in the preceding section, it is expected that incomplete typeface logos will have a favorable influence on consumer perceptions of firm innovativeness but an unfavorable influence on consumer perceptions of firm trustworthiness. It is expected that the former influence is explained by the perceived interestingness of the logo, whereas the latter influence is explained by its perceived clarity. Moreover, incomplete typeface logos have an unfavorable influence on attitude toward the firm, but only for consumers with a prevention focus.

These notions are investigated with a set of three studies. Study 1 consists of three brief experiments, each of which demonstrates the favorable (unfavorable) influence of incomplete typeface logos on perceived firm innovativeness (trustworthiness). Study 2 investigates the moderating role of regulatory focus in the influence of such logos on overall attitude toward the firm. Rather than manipulating regulatory focus directly, firms were chosen that align with either promotion or prevention goals. Finally, Study 3 replicates the findings of the previous studies and also demonstrates (1) the mediating role of logo interestingness in the influence of incomplete typeface logos on perceptions of firm innovativeness, (2) the mediating role of logo clarity in the influence of incomplete typeface logos on perceptions of firm trustworthiness, and (3) the moderating role of regulatory focus in the influence of incomplete typeface logos on overall attitude toward the firm, using a standard manipulation for regulatory focus.

Study 1

Method and Results

A set of three preliminary experiments was conducted to investigate the influence of incomplete typeface logos on consumer perceptions of the firm. A sample (Qualtrics panel: 44% men, M_{age} = 45 years), drawn predominantly from the U.S. population, but also from Canada and Western Europe, participated in the experiments online. The participant pool consists of more than 3 million unique panel members. To avoid self-selection and professional survey takers, Qualtrics utilizes by-invitation-only online panel recruitment, thus attracting a cross-section that better generalizes to the population at large. In each experiment, participants were randomly assigned to one of two versions (incomplete vs. complete) of the same logo. To ensure the cleanest manipulations possible, the logos used in the current research are representations of firm names without additional pictorial elements. In each study, the logos were styled by a professional graphic artist. In one version, the logo was styled such that the characters were complete In the other version, the logo was styled such that parts of the characters were blanked out Fictitious names were used for the logos, such that the influence of incompleteness would not be confounded with influences stemming from existing perceptions of the firm "Consul" for Experiment 1a, "Element" for Experiment 1b, and "April" for Experiment 1c (for stimuli, see Appendix A) Participants (71, 67, and 69 participants in Experiments 1a, 1b, and 1c, respectively) viewed the logo and then responded to a battery of questions They reported their impression of the firm on seven-point Likert scales (1 = "not at all," and 7 = "extremely") Specifically, they reported the extent to which they perceived the firm as innovative and creative (subsequently combined to form an innovativeness index) and as trustworthy and reliable (subsequently combined to form a trustworthiness index) These items stem directly from the theoretical development elaborated in the preceding section To rule out the possible influence of affect stemming from exposure to the logo, participants reported their feelings on seven-point semantic differential scales ("not at all happy/very happy," "not at all excited/very excited," "not at all hopeful/very hopeful," "in a bad mood/in a good mood", subsequently combined to form an affect index) A series of analyses of variance (ANOVAs) were run with incompleteness as the independent variable and the innovativeness index, trustworthiness index, and affect index as dependent variables Table 1 presents the results for all three experiments, as well as correlations and scale reliabilities for the indexes

Discussion

As Table 1 shows, each of the three preliminary experiments revealed the same pattern of results Incomplete (vs complete) typeface logos resulted in perceptions of the firm that were higher (vs lower) in terms of innovativeness (all three ANOVAs revealed significant main effects, except Experiment 1b, which was marginally significant) and lower (vs higher) in terms of trustworthiness (All three ANOVAs revealed significant main effects, for correlations between these two variables, see Appendix B) Furthermore, there were no differences in affect, and the results were identical when controlling for affect Affect was not a significant covariate in any of the analyses, except in the influence of the Consul logo on perceived firm trustworthiness In other words, the experiments largely support H_1 and H_3, across three logos, with three formats to manipulate ambiguity

However, it is not clear how incomplete typeface logos will affect consumers' overall attitude toward a given firm Therefore, the following study was designed to provide insights in this respect On the basis of the preceding theorizing, it is expected that this influence depends on the regulatory focus of the consumer Study 2 thus investigates the influence of incomplete typeface logos on consumer attitudes toward firms that align with promotion versus prevention goals

Study 2

One hundred thirty-five participants (Qualtrics panel 59% men, M_{age} = 46 years), drawn from the same pool as in Study 1, were randomly assigned to one of two versions (incomplete vs complete) of the same logo for the fictitious firm "Centurox" (for stimuli, see Appendix A) Participants were also randomly assigned to one of two versions of the firm In one condition, they read that Centurox was an entertainment company, and in the other condition, they read that it was an insurance company The rationale for this manipulation was that an entertainment company would be associated with promotion goals, whereas an insurance company would be associated with prevention goals (Higgins 1997, Wan, Hong, and Sternthal 2009) As discussed previously, consumers with a promotion focus are concerned with attaining positive outcomes (e g , the fun entertainment firms provide), while those with a prevention focus are concerned with safety, responsibilities, obligations, and avoidance of negative outcomes (aligned with the protection and security insurance firms offer)

Thus, the study was a 2 (incompleteness incomplete vs complete) × 2 (focus promotion vs prevention) between-subjects experiment Participants viewed the logo and then responded to a battery of questions They reported their attitude toward the firm on seven-point semantic differential scales (full scale taken from Hagtvedt and Patrick [2008] "unfavorable/favorable," "negative/positive," "bad/good," "unpleasant/pleasant," "dislike very much/like very much"), later combined in an attitude index (α = 96) To ensure that there were no confounds stemming from preexisting notions of the firm, participants reported, on a seven-point Likert scale (1 = "not at all," and 7 = "definitely"), whether they had heard of the Centurox firm before filling out the survey As expected, the results revealed no differences and a sig-

TABLE 1
Results for Study 1 (Experiments 1a–1c): The Influence of Incomplete Typeface Logos on Consumer Perceptions of the Firm

	Innovativeness					Trustworthiness					Affect			
	r_1	M_I	M_C	F	η^2	r_2	M_I	M_C	F	η^2	α	M_I	M_C	*F*
1a	78	4 36	3 67	5 33**	07	92	3 93	4 53	4 13**	06	83	4 85	4 89	02
1b	85	3 77	3 18	3 16*	05	87	3 18	3 87	4 67**	07	87	4 86	4 73	21
1c	81	3 93	3 34	4 09**	06	94	3 61	4 49	7 57**	10	82	4 88	4 83	04

*$p <$ 10
**$p <$ 05
Notes M_I indicates mean in the incomplete condition, M_C indicates mean in the complete condition, η^2 indicates partial η^2, r_1 and r_2 connote the correlations between the items in the innovativeness index and trustworthiness index, respectively, and α connotes the scale reliability for the affect index

nificantly low average (M = 1 43) To rule out the possible influence of affect stemming from exposure to the logo, participants reported their feelings on the same measures as in Study 1 (α = 83) No differences were found for this variable, and controlling for it revealed identical results Affect was not a significant covariate in the influence of incompleteness on attitude toward the firm As a manipulation check for regulatory focus encouraged by the firm, participants reported on seven-point Likert scales (1 = "not at all," and 7 = "extremely") how relevant it is that a firm enables a consumer to have fun (revealing the expected main effect of focus ($M_{\text{promotion (i e , entertainment)}}$ = 4 19 vs $M_{\text{prevention (i e , insurance)}}$ = 3 39, F(1, 131) = 7 77, $p <$ 05) and how relevant it is that a firm enables a consumer to protect him- or herself (also revealing the expected main effect of focus ($M_{\text{promotion (i e , entertainment)}}$ = 4 47 vs $M_{\text{prevention (i e , insurance)}}$ = 5 18, F(1, 131) = 5 79, $p <$ 05)

An ANOVA with incompleteness and regulatory focus as the independent variables and the attitude index as the dependent variable revealed a main effect of incompleteness (M_I = 3 47 vs M_C = 4 23, F(1, 131) = 9 63, $p <$ 05, partial η^2 = 07) and, more important, the expected incompleteness × focus interaction ($M_{(I,\text{ prom})}$ = 3 85 vs $M_{(c,\text{ prom})}$ = 3 98 vs $M_{(I,\text{ prev})}$ = 3 13 vs $M_{(c,\text{ prev})}$ = 4 47, F(1, 131) = 6 63, $p <$ 05, partial η^2 = 05) Contrast analysis revealed that the incomplete prevention condition was different from the other three conditions (all $p <$ 05) There were no other differences These results support H_5

The results support the theory that the influence of incomplete typeface logos on attitude toward the firm is moderated by regulatory focus The main effect of incompleteness was not hypothesized but does not take away from this result Nonetheless, in the following study, this was avoided by first pretesting the logos for equivalent influence on attitude toward the firm in the absence of a regulatory focus manipulation Moreover, although the regulatory focus manipulation in Study 2, through type of firm, was noteworthy because of its clear applicability to firms in the marketplace, it also has weaknesses It is an indirect form of manipulation that may also be related to different consumer goals, such as hedonic versus utilitarian goals Therefore, a standard regulatory focus manipulation from extant literature was used in Study 3

Study 3

Method

Study 3 was designed to replicate the results from the previous studies and to demonstrate (1) the mediating role of logo interestingness in the influence of incomplete typeface logos on perceptions of firm innovativeness, (2) the mediating role of logo clarity in the influence of incomplete typeface logos on perceptions of firm trustworthiness, and (3) the moderating role of regulatory focus in the influence of incomplete typeface logos on attitude toward the firm, using a different manipulation [1] One hundred twenty participants (Qualtrics panel 56% men, M_{age} = 45, modal income = $50,001–$75,000), drawn from the same pool as in Study 1, participated in the experiment online Participants were subjected to a standard manipulation to induce a promotion versus prevention focus (Wan, Hong, and Sternthal 2009) Those in the promotion (prevention) condition were asked to think about a positive (negative) outcome they might want to achieve (avoid) and briefly describe the strategies they could use to successfully promote (prevent) this outcome Participants were also randomly assigned to one of two versions (incomplete vs complete) of the same logo, with the fictitious name "Salient" (for stimuli, see Appendix A) The study was a 2 (incompleteness incomplete vs complete) × 2 (focus promotion vs prevention) between-subjects experiment Participants viewed the logo and then responded to a battery of questions

Measures

The same measures as in Study 1 were used for the innovativeness index (r = 85), the trustworthiness index (r = 90), and the affect index (α = 86) As expected, no differences were found for this latter variable, and it was not a significant covariate in the main analyses Participants also reported, on seven-point Likert scales (1 = "not at all," and 7 = "definitely"), their impression of the logo as interesting, artistic, and engaging (later combined in an interestingness index, α = 91) and as clear, complete, and immediately readable (later combined in a clarity index, α = 89) They further reported, using the same measures as in Study 2, on their attitude toward the firm, the results of which were later combined to form an attitude index (α = 96) To ensure that there were no confounds stemming from preexisting notions of the firm, participants reported, on a seven-point Likert scale (1 = "Not at all," and 7 = "Definitely"), whether they had heard of the Salient firm before filling out the survey As expected, results revealed no differences and a significantly low average (M = 1 39)

Results

Innovativeness A 2 (incompleteness incomplete vs complete) × 2 (focus promotion vs prevention) ANOVA with the innovativeness index as the dependent variable revealed the expected main effect of incompleteness (M_I = 4 18 vs M_C = 3 39, F(1, 116) = 9 30, $p <$ 05, partial η^2 = 07), supporting H_1 There were no other differences

Trustworthiness A similar ANOVA with the trustworthiness index as the dependent variable revealed the expected main effect of incompleteness (M_I = 3 29 vs M_C = 3 80, F(1, 116) = 5 07, $p <$ 05, partial η^2 = 04), in support of H_3 There were no other differences

Mediating role of interestingness Bootstrap estimation (Preacher and Hayes 2004) with 5000 resamples, as well as a Sobel test, confirmed that interestingness mediates the influence of incompleteness on perceived innovativeness (M = – 31, SE = 10, 95%, confidence interval = – 50, – 12, Sobel test z = –3 08, $p <$ 05) This supports H_2

Mediating role of clarity Bootstrap estimation with 5000 resamples and a Sobel test confirmed that readability mediates the influence of incompleteness on perceived trustworthiness (M = 23, SE = 11, 95%, confidence interval = 03, 46, Sobel test z = 2 50, $p < 05$) This supports H_4

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[1] A preliminary study with 85 undergraduate participants not only replicated the results from Study 1 but also revealed that the incomplete (vs complete) logo resulted in more (vs less) perceptions of logo interestingness and less (vs more) perceptions of logo clarity

Attitude toward the firm A 2 (incompleteness) × 2 (focus) ANOVA with the attitude index as the dependent variable revealed the expected incompleteness × focus interaction ($M_{(i,\ prom)} = 4\ 01$ vs $M_{(c,\ prom)} = 3\ 66$ vs $M_{(i,\ prev)} = 3\ 24$ vs $M_{(c,\ prev)} = 4\ 04$, $F(1, 116) = 5\ 67$, $p < 05$, partial $\eta^2 = 05$) Contrast analysis revealed that the incomplete prevention condition was different from the complete prevention condition ($p < 05$) and the incomplete promotion condition ($p < 05$) There were no other differences These results support H_5

Discussion

This study replicates the results of the previous studies as well as provides some additional insights Logo interestingness was demonstrated to mediate the influence of incomplete typeface logos on perceived firm innovativeness, while logo clarity was demonstrated to mediate the influence of incomplete typeface logos on perceived firm trustworthiness (for correlations between these four variables, see Appendix B) These mediation analyses not only support the current study's theories but, in the current experimental context, also align with an argument of straightforward logic The judgment of the firm must perforce be based on the perception of the logo, because it is the only basis provided to the respondent In addition, the study demonstrates that regulatory focus moderates the influence of incomplete typeface logos on overall attitude toward the firm As expected, an incomplete (vs complete) logo gave rise to a less (vs more) favorable attitude toward the firm, but only for consumers with a prevention focus

General Discussion

Theoretical Contributions

Incompleteness is an element of both art theory and practice, and its demonstrated implications in terms of perceived innovativeness and trustworthiness contribute not only to marketing theory but also back to the literature on art and aesthetics Furthermore, both innovativeness and trustworthiness are important constructs in the marketing strategy literature, and little research has investigated how visual communication or promotional materials influence these types of perceptions among a firm's customers Perhaps this is because common intuition suggests that such perceptions result over time from the resources firms bring to bear on daily operations, on building strategic competencies, or on inculcating a specific corporate culture However, as the current research illustrates, such perceptions are also influenced by visual inputs that might, on the surface, seem irrelevant or of minor importance Some extant literature (Henderson, Giese, and Cote 2004) has argued that logos may engender specific consumer perceptions of the firm but that there are likely to be multiple responses to the same logo, such that corporations must consider trade-offs The current research builds on and exemplifies this argument

The current research also establishes new connections between the regulatory focus literature and the perceptual ambiguity literature, and it contributes to the literatures on visual communication and ambiguity in general Whereas prior research on perceptual ambiguity has demonstrated enhanced evaluations resulting from positive affect (Peracchio and Meyers-Levy 1994), the current research demonstrates specific judgments arising from perceptual ambiguity, regardless of affect The conceptual specificity of innovativeness and trustworthiness also diverges from prior observations of the general visual appeal and arousal-raising capacity of perceptual ambiguity (Berlyne 1971, Zeki 2001) In addition, the current research answers a call for more research to determine the extent of impression transfer from typeface to the brand and company itself (Henderson, Giese, and Cote 2004) In the current context, not only does perceptual ambiguity engender specific conceptual judgments, but when coupled with a prevention focus, it also has a potentially unfavorable influence on overall attitude toward the firm This finding also diverges from prior findings of favorable consumer responses to perceptual ambiguity (Peracchio and Meyers-Levy 1994)

Managerial Implications

Although it is well established that consumer perceptions of the firm arise from sustained corporate efforts or from a well-documented track record, the current research demonstrates that such perceptions also arise from minor differences in the visual promotional material the firm employs For example, managers may use incomplete typeface logos as a tool to position a firm as innovative, as indicated by the finding that such logos encourage this perception among consumers This may be useful for a new firm aiming to position itself as cutting-edge or for an old, stodgy firm aiming to reinvent its brand image However, caution may be called for in the use of this tool, especially if the perception of trustworthiness is of central importance The current findings suggest that managers should avoid incomplete typeface logos if their goal is to encourage the perception of a trustworthy firm

The finding that regulatory focus moderates the influence of incomplete typeface logos on attitude toward the firm suggests that managers should be especially careful to avoid such logos in connection with firms whose product offerings align with a prevention focus (e g , insurance companies) However, although incomplete typeface logos may give rise to unfavorable consumer attitudes toward these types of firms, this seems not to be the case for firms whose product offerings align with a promotion focus (e g , entertainment companies) This suggests that the ideal firm with which to utilize incomplete typeface logos is one whose offerings align with a promotion focus and that managers want to position as innovative (e g , companies offering creative entertainment or innovative consumer products, such as Apple or Sony) In addition, managers of firms with incomplete typeface logos may intentionally use advertising copy and other promotional materials to encourage a promotion focus in their consumers

Directions for Further Research

There are many other variables that also influence consumer attitudes and consumer perceptions of firm innovativeness or trustworthiness For example, an established track record may counteract the unfavorable influence of incomplete typeface logos on perceived trustworthiness One reason fictitious firms were used in the current research was to avoid confounds tied to existing consumer perceptions of the firm However, further research could explore possible interactions between the influence of incomplete typeface logos and influences stemming from existing consumer perceptions of real firms Such research could rely on existing logos, or it could incorporate alternate or modified logos for these firms

Related theoretical perspectives may also be incorporated into further research For example, researchers could investigate the influence of incomplete typeface logos or different types of logo design, or perceptual ambiguity in general, on brand personality (Aaker 1997) Moreover, extant research has suggested that incomplete typeface logos could adversely influence consumer perceptions as a result of low processing fluency (Song and Schwarz 2008) It would perhaps be difficult to make a convincing argument that an unfavorable influence on perceptions such as firm trustworthiness should stem from low processing fluency, but other influences may be tied to this mechanism For example, the influent processing of an incomplete typeface logo might give the impression that the firm's products are complex or effortful to use In general, researchers in the future should investigate the impact of logo incompleteness and of other forms of perceptual ambiguity on information processing on perceptions other than innovativeness and trustworthiness, which may in turn influence overall attitude toward the firm, as well as on variables such as recognition and recall, purchase behavior, and customer satisfaction

Although the current research reveals an unfavorable influence of incomplete typeface logos on overall attitude toward the firm for consumers with a prevention focus, it may also have a favorable influence on consumers with a promotion focus under certain circumstances, presumably when perceptual ambiguity is interpreted as a strong signal of opportunity Researchers should investigate this as well as other possible moderators The responses to logo incompleteness and other forms of perceptual ambiguity may also vary across individual consumers according to chronic individual differences, as responses to aesthetic stimuli often do (Bloch, Brunel, and Arnold 2003) They may also vary across cultures Furthermore, the environment in which the logo is displayed may moderate its influence on various consumer responses For example, a logo in a retail environment may not necessarily have the same impact on consumers as a logo in a magazine, on packaging, or on a website

Further research could also investigate the influences stemming from different levels of logo incompleteness It seems likely that extreme forms of incompleteness might have different influences on firm perceptions than the ones uncovered here For example, the influence of logo incompleteness on perceived firm innovativeness may reveal an inverted U shape, with both complete and extremely incomplete logos engendering the least favorable responses Moreover, affect did not play a role in the current research, but researchers in the future should explore consumers' levels of enjoyment and positive affect when resolving various types and degrees of perceptual ambiguity, as well as the impact this has on consumer attitudes Perhaps it is possible to systematically map out the circumstances under which affect plays a role

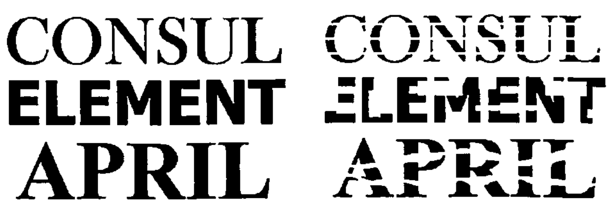
Whereas the current research focuses on incomplete typeface logos as the basis for perceptual ambiguity, further research could expand on this by using different types of logos, including different variables such as color, and incorporating various bases for perceptual ambiguity, such as abstractions versus concrete images, different levels of obscurity, distortions, the use of reversible figures, and so on The influence of conceptual ambiguities might also be investigated For example, researchers could investigate what influences arise from the use of a name like "Fidelity," which has a clear meaning, versus a name like "TIAA-CREF," which does not, for a financial services firm Extending the findings of the current research, it might be expected, holding aside any preexisting consumer perceptions of these firms, that Fidelity would be viewed as more trustworthy and TIAA-CREF would be viewed as more innovative Furthermore, it might be expected that consumer attitudes toward the latter firm would depend on whether consumers are predominantly focused on the prospects for achieving profits or the likelihood of preventing losses and maintaining financial security

Broadly speaking, the findings that incomplete typeface logos have a favorable influence on perceived firm innovativeness but an unfavorable influence on perceived firm trustworthiness, as well as the moderating role of regulatory focus in the influence of such logos on attitude toward the firm, underscore the complexity of consumer response that can arise from logo design, or from perceptual ambiguity in general The various influences of perceptual ambiguity are not adequately understood and merit a great deal of further attention, not only because of the vast amounts of resources that firms expend on logos as a marketing tool, but also because the influences of both perceptual and conceptual ambiguity represent gaps in the marketing literature and in the understanding of how consumers interpret visual stimuli

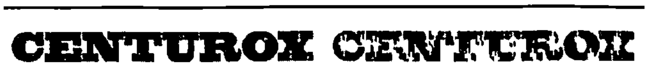
APPENDIX A

Complete and Incomplete Typeface Logos Used as Stimuli in Studies 1–3

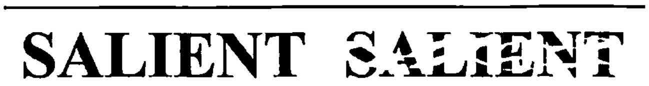
A. Stimuli Used in Study 1 (Experiments 1a–1c)



B: Stimuli Used in Study 2



C: Stimuli Used in Study 3



APPENDIX B
Correlations Between Key Variables for Studies 1 and 3

		Innovativeness	Trustworthiness	Interestingness
Study 1a	Trustworthiness	53		
Study 1b	Trustworthiness	55		
Study 1c	Trustworthiness	57		
Study 3	Trustworthiness	37		
Study 3	Interestingness	76	43	
Study 3	Clarity	– 04	31	06

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Andrea Godfrey, Kathleen Seiders, & Glenn B. Voss

Enough Is Enough! The Fine Line in Executing Multichannel Relational Communication

In an effort to build long-term, profitable relationships, many companies systematically engage in multichannel relational communication—personalized messages sent to existing customers through various channels as part of a broader relationship marketing strategy In this research, the authors examine three key drivers of relational communication effectiveness volume of communication, mix of communication channels, and alignment of those channels with customers' preferences They hypothesize that customer response to relational communication follows a continuum in which reciprocity explains response to lower levels of communication, the classic ideal point describes a transition phase, and reactance explains response to higher levels of communication They empirically test the theoretical framework by examining the impact of multichannel communication on repurchase over a three-year period The results indicate that after the ideal level of communication is exceeded, customers react negatively This negative response can be exacerbated by the use of multiple channels but attenuated by aligning channels with customer preferences The findings suggest that the complex effects of multichannel communication can actually drive customers away from rather than closer to a company

Keywords multichannel relational communication, ideal point, reactance, reciprocity, customer repurchase

> I spent two months assessing and segmenting the database of past donors and creating a plan for scheduling personal meetings with 60 high-gift-capacity donors Ten donors were leery about speaking with me I left messages for another 30 donors, but only three returned my call Five donors hung up on me with varying degrees of anger One person said that I was the third person to call in three days Thirteen donors also received a handwritten note to inform them of our fundraising campaign In the end, I did not book a single appointment Because our organization relies heavily on phone and mail contacts along with face-to-face fundraising, potential donors have already been bombarded by mail and phone calls by the time I try to arrange a personal meeting I am removing all of my donors from the phone and mail contact lists to control how much communication they receive from us
>
> —Major gifts officer, national nonprofit agency

Marketers champion the idea of focusing resources on customer retention strategies to avoid expensive acquisition initiatives and cultivate customer profitability To encourage loyalty and build long-term relationships, firms must communicate with their customers in a compelling way However, what if such marketing communication drives customers away from rather than closer to the company? As the major gifts officer in the preceding quote discovered, even an organization's most ardent supporters can be alienated when they feel bombarded by the communication

This research focuses on multichannel relational communication, which we define as personalized communication with existing customers through various channels as part of a broader relationship marketing strategy In an effort to retain and cross-sell to existing customers, companies use individual-level customer data to personalize this communication The communication can remind customers of needed services, announce new products and locations, survey customer satisfaction following a service encounter, and convey targeted promotional offers

Despite widespread use, multichannel relational communication has only recently attracted attention in the marketing literature, and its effects on customer repurchase are not well understood Although general consensus exists that some amount of communication is better than none, relevant marketing theories and the limited empirical evidence are equivocal as to whether there is an ideal level beyond which additional communication leads to diminishing or even negative returns For example, reciprocal action theory implies that increasing relational communication positively influences repurchase because customers perceive greater relationship investment by the firm Conversely, reactance theory suggests that increasing relational communication

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has a negative influence on repurchase because customers perceive the communication as invasive or obtrusive The reciprocity perspective is supported by empirical studies reporting a positive linear association between relational communication volume and repurchase behavior, while reactance is supported by research reporting an inverted U-shaped effect between relational communication volume and repurchase behavior

The challenge of understanding multichannel communication effects is complicated by the limited knowledge of how channels combine to influence customer repurchase When firms use different communication channels in combination, it is a matter of speculation whether the effects are additive or multiplicative and, if multiplicative, whether the interaction enhances or diminishes customer response Communication through multiple channels could enhance customer response by demonstrating greater resource investment on the part of the firm or could alienate customers by signaling an inadequate appreciation of one-to-one communication Empirical studies involving the simultaneous use of multiple channels are particularly scant

The mixed evidence as to whether there is an ideal level of communication—and how that level might vary when firms use multiple channels—undermines managerial practice in terms of effectively allocating marketing resources Managers face additional challenges in aligning the communication channels used with customers' preferences Although we might assume that aligning communication channels with customers' preferences increases the utility of the contacts, research has not examined the strength or importance of this moderating effect

To explore these important and unresolved issues in current knowledge, we examine a set of interrelated research questions Is there an ideal volume of relational communication? How is customer response to multichannel communication influenced by the total volume of communication and the mix of channels used? and To what degree do customers' channel preferences moderate the relationship between relational communication volume and customer repurchase? In addressing these questions, our study contributes theoretical, empirical, and substantive insights into the complex nature of multichannel communication

We present a conceptual framework that integrates reciprocal action theory and reactance theory perspectives to describe the effects of multichannel relational communication on customer repurchase behavior Together, these theories describe a continuum of customer response to relational communication, with lower volumes eliciting reciprocity and higher volumes triggering reactance An ideal point along this continuum identifies the volume at which customer repurchase shifts from positive reciprocity to negative reactance After that ideal point, additional contacts diminish rather than enhance customer repurchase

We offer empirical support for this framework by examining the impact of multichannel relational communication on customer repurchase over three years The longitudinal analysis provides a fine-grained examination of multichannel effects by combining three distinct data sets (1) customer contact records, (2) customer transaction data, and (3) survey data capturing customers' channel preferences We use these data to estimate a system of simultaneous equations with endogenous variables The results indicate that there is an ideal level of communication volume that varies across channels, the ideal point also shifts in response to multichannel communication efforts and across individual people, depending on their channel preferences

Because shifts in the ideal point directly influence repurchase behavior, our results provide substantive insights that can lead to more effective customer relationship strategies The findings highlight the importance of considering the impact of specific channels, individually and in combination, rather than aggregate volume as a means to manage the communication channel mix more effectively The results also underscore the need to avoid inefficient allocation of marketing resources by developing protocols that limit total communication through all channels and specify effective channel combinations

In the sections that follow, we develop a conceptual framework that predicts diminishing effects of multichannel relational communication on customer repurchase We extend the framework to examine interaction effects for combinations of channels and for customer-level channel preferences We then present the empirical model and results and conclude with implications for researchers and managers

Conceptual Framework

Reciprocal action theory builds on social norm theory to describe the obligation people experience to return "good for good," in which the response is proportional to what is received (Bagozzi 1995, Becker 1990) In market exchanges, firm investments in customer relationships can produce psychological bonding that triggers the normative reciprocity of purchase (Dahl, Honea, and Manchanda 2005) Customer reciprocity manifests when individualized communication increases perceived relationship quality (De Wulf, Odekerken-Schroder, and Iacobucci 2001) or feelings of gratitude toward the firm (Palmatier et al 2009) Reciprocity suggests that relational communication positively influences repurchase because customers perceive a greater resource investment by the firm and enhanced informative or interpersonal value

Reactance theory posits that attempts to influence behavior generate a motivational state of reactance (Brehm 1966) Customers resist marketing efforts that they perceive as an attempt to manipulate them, exercise control over their purchasing, or limit their freedom of choice (Clee and Wicklund 1980) As pressure from a firm's persuasion attempts increases, the reactance response grows stronger, resulting in diminished influence on customer behavior or, at extremes, a backlash or boomerang effect (Fitzsimons and Lehmann 2004, Wendlandt and Schrader 2007) Reactance theory can explain negative response to personal selling (e g , Wicklund, Slattum, and Solomon 1970), advertising (e g , Robertson and Rossiter 1974), direct marketing (e g , Morimoto and Chang 2006), and rewards programs (e g , Kivetz 2005) Prior studies have focused primarily on reactance to message content characteristics in transactional exchanges (e g , Clee and Wicklund 1980, Fitzsimons and Lehman 2004) In contrast, we examine reactance to communication volume in relational exchanges, in which theory predicts a negative customer response to communication perceived as invasive, obtrusive, or environmentally wasteful

The relational communication literature provides empirical evidence that both theoretical perspectives are relevant to understanding customer response to firm contact As Table 1 indicates, the limited empirical studies in this area offer conflicting results The reciprocity principle is supported by several studies that find positive linear effects of relational communication on outcomes such as customer profitability, share of wallet, and relationship duration (Reinartz, Thomas, and Kumar 2005, Rust and Verhoef 2005, Verhoef 2003) Reactance receives support in studies that report an inverted U-shaped relationship between communication and purchase frequency (Venkatesan and Kumar 2004) and customer retention (Drèze and Bonfrer 2008), as well as a U-shaped relationship between communication and purchase timing (Kumar, Venkatesan, and Reinartz 2008) Reconciling the mixed results from this emerging set of studies is difficult because of variations in the operationalization of communication, the customer outcomes measured, and the research contexts

The Classic Ideal Point and Relational Communication Volume

We propose that reciprocity explains why customer repurchase is likely to increase as communication volume increases from low to moderate levels, whereas reactance explains why repurchase is likely to decrease as communication increases from moderate to high levels To describe the transition phase of the reciprocity–reactance continuum, we draw on the classic ideal point concept, which posits that the perfect or utility-maximizing level of an attribute occurs at an intermediate level that elicits the most positive response (Teas 1993) Initially, as an attribute increases up to the ideal point, utility also increases and customer response becomes more favorable (Green and Srinivasan 1978) After the ideal point is attained, further increases in the attribute instead result in negative utility and less favorable customer response (Lilien, Kotler, and Moorthy 1992) Applied to multichannel relational communication, this continuum suggests that customers reciprocate with greater repurchase as communication increases, up to the ideal point, beyond that point, they exhibit reactance and repurchase less in response to further increases Therefore, the ideal point implies an inverted U-shaped relationship between relational communication volume and customer repurchase

The ideal point conceptualization is similar to the two-factor paradigm for predicting customer response to mass marketing communication This theory proposes that opposing factors determine customer response to repeated advertising stimuli (e g , Berlyne 1970, Rethans, Swasy, and Marks 1986) Initial exposures produce a positive response due to reduced uncertainty and learning about the stimulus (Stang 1975), but higher levels of exposure produce a negative response due to tedium or reactance (Sawyer 1981) The net effect of the opposing factors is a diminishing relationship between the amount of advertising and customer response beyond a certain threshold (Anand and Sternthal 1990)

The ideal point should describe customer response to relational communication for any channel a firm uses In this study, we examine communication volume through three channels firms commonly use for targeted customer contacts telephone, e-mail, and postal mail We formally hypothesize the following

> H_1 For each communication channel, there is an ideal level of relational communication volume, which implies an inverted U-shaped relationship between customer repurchase and (a) telephone contact volume, (b) e-mail contact volume, and (c) mail contact volume

Communication Channels in Combination

The use of multiple communication channels in combination can stimulate either additive, independent effects, or multiplicative interaction effects Interaction effects imply that the ideal point for relational communication volume in one channel depends on the level of communication in another channel As volume in one channel changes, the ideal point for volume in the other channel shifts to a higher or lower point Cross-channel interactions are consistent with both reciprocal action theory and reactance theory, but the two theories differ as to whether the interactions are positive or negative

Customers may respond positively when they receive relational communication through a combination of channels, because the use of multiple channels, rather than a single channel, shows greater resource investment by the firm Because of their varying characteristics, different channels provide distinctive advantages in communicating information to customers For example, the telephone channel allows bidirectional communication and the capacity for the customer to be involved in the communication (Mohr and Nevin 1990), and the e-mail channel offers customers the ability to view rich visual representations of the information being conveyed (Alba et al 1997) Contacting customers through multiple channels allows firms to offer customers complementary benefits that enhance the overall utility of the communication, signifying greater resource investment When customers attribute the enhanced utility to firm actions, they reciprocate with increased spending

This reciprocity-based perspective is consistent with a central tenet of integrated marketing communication, which holds that the combined effect of using multiple media channels is greater than the sum of the individual effects of each channel (Naik and Raman 2003) For example, using mass-media channels that effectively build brand awareness can enhance the effects of channels used to communicate more detailed information (Prins and Verhoef 2007) While limited research systematically examines synergies between communication channels, especially at the individual customer level, it is logical to expect such effects to be even more pronounced for direct channels because the customers may value customized content more

The theoretical implication is that communication through multiple channels shifts the ideal point so that customers exhibit reciprocity up to a higher volume in one or

TABLE 1
Recent Empirical Studies of Relational Communication Effects on Customer Repurchase Behavior

Study	Relational Communication Variables *Operationalization*	Dependent Variables *Operationalization*	Effect of Relational Communication on Repurchase Behavior	Theory Consistent with Findings
De Wulf, Odekerken-Schroder, and Iacobucci (2001)	Direct mail *Three survey items on seven-point Likert scale capturing customer's perception of firm's efforts to keep regular customers informed through mail contacts*	Perceived relationship investment *Three survey items on seven-point Likert scale capturing customer's perception of firm's efforts to contribute value to regular customers*	Positive linear effect (Europe) Nonsignificant effect (United States)	Reciprocity
Drèze and Bonfrer (2008)	Inter-e-mail time *Number of days since last e-mail contact*	a Customer retention *Estimated customer retention probability* b Customer equity *Calculated customer equity*	a, b Inverted U-shaped effect	Ideal point
Kumar, Venkatesan, and Reinartz (2008)	a Frequency of rich modes of communication *Number of face-to-face contacts* b Frequency of standardized modes of communication *Number of telephone and mail contacts*	Purchase timing *Time (in months) between previous observed purchase and current observed purchase*	a, b U-shaped effect	Ideal point
Prins and Verhoef (2007)	Direct marketing communication *a Dummy indicating whether a telephone contact was sent in month t* Direct marketing communication × mass marketing communication *b Dummy indicating whether a telephone contact was sent in month t × advertising expenditures in month t*	Adoption timing *Time (in months) between service introduction and customer's adoption*	a Positive effect b Negative interaction effect	Reciprocity Reactance
Reinartz, Thomas, and Kumar (2005)	Communication contacts *a Number of face-to-face contacts* *b Number of telephone contacts* *c Number of e-mail contacts* Communication contact interactions *d Monthly occurrence of both face-to-face and e-mail contacts* *e Monthly occurrence of both telephone and e-mail contacts*	f Acquisition likelihood *Indicator variable showing whether customer is acquired* g Relationship duration *Time (in days) of customer's relationship with the firm* h Customer profitability *Total revenue—total costs*	a, b, c Positive linear effect d, e Positive interaction effect for all dependent variables	Reciprocity Reciprocity
Rust and Verhoef (2005)	a Transaction-oriented communication *Number of direct mail promotion contacts* b Relationship-oriented communication *Number of relationship magazine contacts*	Change in gross profit per customer *Gross profit per customer = total number of services purchased × contribution margin*	a, b Positive linear effect	Reciprocity
Venkatesan and Kumar (2004)	a Frequency of rich modes of communication *Number of face-to-face contacts* b Frequency of standardized modes of communication *Number of telephone and mail contacts*	Purchase frequency *Total number of products purchased*	a, b Inverted U-shaped effect	Ideal point
Verhoef (2003)	Direct mailings *Number of mail contacts*	Change in customer share *Customer share = number of services purchased from focal firm (observed)/number of services purchased from all firms (self-report)*	Positive linear effect	Reciprocity

both channels, leading to increased repurchase. A customer's repurchase response to relational communication volume in one channel is enhanced as the volume of communication in another channel increases, manifesting as a positive interaction between any two channels used in combination.

Reinartz, Thomas, and Kumar (2005) provide empirical support for this perspective in a business-to-business context and report positive interactions when firms used (1) face-to-face and e-mail and (2) telephone and e-mail channels in combination. However, they measure the interaction between channels as the number of times two communication channels were used concurrently in a given month, an operationalization that may understate multiplicative effects because it does not capture the total volume of communication through each channel.

An opposing perspective is also plausible. Customers might demonstrate reactance and respond negatively when they receive relational communication through a combination of channels. The use of multiple channels might imply that the firm is employing an ad hoc rather than a customized approach to communicate with customers. Just as different communication channels offer distinct benefits, they also provide distinct disadvantages. For example, the mail channel can be environmentally wasteful, and the e-mail channel can heighten privacy concerns (Morimoto and Chang 2006). From this perspective, contacting customers through multiple channels implies an uninformed communication program, because the combined channels require the customer to manage a variety of annoyances that decrease the overall utility of the communication. Customers ultimately feel trapped and victimized by a seemingly manipulative relational marketplace (Fournier, Dobscha, and Mick 1997).

Theoretically, the reactance-based perspective predicts that the use of multiple channels shifts the ideal point in one or both channels so that reactance is triggered at a lower volume. Customer response to relational communication volume in one channel peaks at a lower level and then diminishes as the volume of communication in another channel increases. This effect would manifest as a negative interaction between any two channels used in combination and results in a diagonal, downward shift in the response function that attenuates the peak response.

Although a paucity of research has examined the effects of multichannel communication on repurchase, Prins and Verhoef (2007) offer evidence of customer reactance to the use of multiple channels. They report that telephone contact and mass communication (e.g., television, radio, print, outdoor) have negative interaction effects on adoption timing for a new service. They suggest that the use of both communication channels in combination causes customers to believe that the firm is placing too much attention on the new service and pressuring them excessively to adopt. Although that study examines the interaction between direct telephone and mass channel communication rather than multiple direct, personalized channels, the findings suggest that communication through a combination of channels can have a negative interaction effect on purchase behavior.

In summary, both theory and empirical evidence suggest multiplicative, interaction effects between multichannel communication volume and repurchase, but results reported in prior studies offer divergent support for the direction of the interaction. As such, we leave the question whether the interactions are positive or negative to be determined empirically. More formally, we hypothesize the following:

> H_2: Relational communication volume using more than one channel produces shifts in the ideal point for at least one channel, which implies significant interaction effects on customer repurchase for (a) telephone × e-mail contact volume, (b) telephone × mail contact volume, and (c) e-mail × mail contact volume.

The Moderating Role of Channel Preference

Various perspectives imply that communication channel preference is idiosyncratic and that heterogeneity in individual channel preferences influences customer response to relational communication. For example, the telephone channel is commonly perceived as one of the most intrusive (Reinartz, Thomas, and Kumar 2005), but some customers prefer its interpersonal nature, which enables them to request clarification and elaboration of the message (Roberts and Berger 1999). Some customers perceive a company's use of costly communication channels as a proxy for relationship investment, whereas others regard such costs as an inefficient expense that ultimately increases price (Palmatier 2008). Boulding et al. (2005) encourage researchers to examine such heterogeneity to understand customer response to relationship marketing actions.

Reciprocal action and reactance theories both suggest that customers' channel preferences moderate their response to relational communication and produce a shift along the reciprocity–reactance continuum to a higher ideal point. The reciprocity principle suggests that identifying and using preferred channels enhances customers' motivation to reciprocate because they appreciate the company's personalization efforts. As a result, customers respond more positively to higher volumes of communication than they do when their preferred channels are not used. Although prior research has not examined the moderating effect of channel preferences theoretically or empirically, this expectation is consistent with the finding that direct communication aligned with customer needs increases perceived relationship investment and encourages reciprocity (De Wulf, Odekerken-Schroder, and Iacobucci 2001).

Reactance theory suggests that matching the communication channel with customers' preferences attenuates reactance related to communication volume. When a customer views a channel as intrusive, for example, managing that channel's contacts requires greater effort and creates more reactance (Kivetz 2005). If customers prefer channels that provide greater utility, the matching process enhances the overall value of the communication, thereby decreasing reactance and increasing repurchase response. This perspective is consistent with Fitzsimons and Lehmann (2004), who find that offering product recommendations that are inconsistent with a customer's a priori preferences triggers reactance, but providing recommendations that align with preferences enhances satisfaction with the purchase decision process. The authors advocate that firms directly measure customers' preferences.

In effect, both theoretical perspectives imply that aligning channels with customers' preferences increases receptivity to the communication and shifts the ideal point to a higher volume Formally,

H_3 Customer preference for a channel shifts the ideal point for relational communication through that channel and enhances customer response, which implies a positive interaction effect on customer repurchase for (a) telephone channel preference × telephone contact volume, (b) e-mail channel preference × e-mail contact volume, and (c) mail channel preference × mail contact volume

Empirical Application

Our research design features data from three sources, combining survey data that capture customer channel preferences with 39 months of customer contact history and repurchase behavior We collected the data for customers of a large automobile dealership with a high-volume service department The survey sampling frame included 3370 randomly selected customers who had visited the service department within the past year We sent each customer a packet that included a letter from the owner of the dealership, a five-page survey, a postage-paid return envelope, and an offer for a $5 gift card on return of the completed questionnaire We mailed follow-up surveys to all nonrespondents four weeks after the initial mailing The two mailings produced 180 undeliverable addresses and 1162 complete responses, for a 36% effective response rate The majority of the respondents were men (57%) and were between the ages of 35 and 64 years (60%) Sixty-nine percent had some technical or university education, and 66% had an average household income exceeding $63,000

For each customer, we matched survey responses with the corresponding objective data from the company's contact records and transaction database Contact records included the dates each customer was contacted and the communication channel used for each contact The transaction database captured the date of each customer's visit and the dollar amount spent To facilitate a longitudinal analysis, we aggregated the data into 13 quarterly periods (quarters 0–12), which constitute the 39-month observation period

The combined data sets represent panel data that are subject to several forms of bias (Hsiao 2004) First, cross-sectional differences in the dependent variable not captured by the explanatory variables can manifest as a heterogeneity bias and produce inconsistent estimates of the coefficients of interest Second, the survey data we use to capture the panel's communication preferences are subject to selection bias if the panelists' decision to respond to the survey is related to repurchase, the dependent variable of interest Third, our analysis of customer response to relational communication is subject to endogeneity bias because marketers tend to communicate more with customers who repurchase more, so causality may be circular We now describe the key variables and the methods we use to control for all three forms of bias

Variables

Table 2 presents descriptive statistics and variable correlations The Appendix provides additional details on the measurement of each variable

Dependent variables Consistent with the theoretical framework, the dependent variable of interest should capture customer response to relational communication We examined two direct measures of customer response repur-

TABLE 2
Descriptive Statistics and Correlation Matrix

Variables	1	2	3	4	5	6	7	8	9	10
1 Repurchase spending[a]	1 0									
2 Repurchase visits[a]	59	1 0								
3 Telephone contacts[a]	15	27	1 0							
4 E-mail contacts[a]	09	18	04	1 0						
5 Mail contacts[a]	16	29	22	– 02	1 0					
6 Telephone preference	01	05	05	– 08	07	1 0				
7 E-mail preference	02	04	– 07	21	– 02	– 16	1 0			
8 Mail preference	– 03	– 04	– 02	– 05	– 01	13	10	1 0		
9 Warranty work[a]	43	41	10	05	11	01	03	– 01	1 0	
10 Number of vehicles	15	30	04	12	15	03	07	00	09	1 0
Mean	122 3	2 12	1 25	62	1 31	3 54	2 81	3 12	25 47	2 20
Standard deviation	295 9	2 80	1 39	1 38	1 92	1 15	1 28	1 08	112 0	1 49
Standard error	2 50	02	01	01	02	01	01	01	95	01
Skewness	6 68	2 02	1 36	2 89	2 28	– 58	13	– 21	15 62	86
Minimum	0	0	0	0	0	1	1	1	0	1
Maximum	5376	25	14	14	16	5	5	5	4302	5
Median	25 40	1	1	0	1	4	3	3	0	1
Lower 99% CL	115 8	2 06	1 22	59	1 27	3 51	2 78	3 10	23 03	2 17
Lower 95% CL	117 4	2 07	1 23	59	1 28	3 52	2 79	3 10	23 61	2 18
Upper 95% CL	127 2	2 17	1 28	64	1 35	3 56	2 83	3 14	27 32	2 22
Upper 99% CL	128 7	2 18	1 28	65	1 36	3 56	2 84	3 14	27 91	2 23

[a] Quarterly measures

Notes Correlations greater than I 02I are significant at $p <$ 05 (two-tailed test) chase visits and repurchase spending for each customer during quarters 1–12. We log-transformed both dependent variables to improve distribution normality.

Control variables. We included mean-centered main and quadratic terms for the 12 quarters (TIME) to allow for trend effects. To control for heterogeneity across individual respondents, we included four exogenous variables that are not directly related to our research questions but are related to auto service spending levels. All four variables were captured in the transaction database: lagged repurchase spending (lagSPEND), lagged number of repurchase visits (lagVISIT), the amount of warranty work in the current quarter (WW), and the number of vehicles each respondent owned (VEH). We log-transformed the warranty work variable to improve distribution normality.

We controlled for selection bias using Heckman's (1979) two-step procedure. We first estimated the probability of responding to our survey using relevant information for all customers in the sampling frame: the number of relational communications before the survey through each communication channel, household income (HI), which we determined from census data by zip code, and whether the respondent had moved to a different home address during the observation period (MOVE), as captured in the transaction database. We then created an inverse Mills ratio for each respondent (λ), which is a monotonic decreasing function of the probability that each customer responded to our survey. Including the inverse Mills ratio in the empirical model controls for the effect of unmeasured characteristics related to the selection process.

Exogenous independent variables. Channel preference was a self-reported measure that captured customers' responses to a single five-point Likert-scale question asking whether the customer preferred to be contacted through each channel (PrefPHONE, PrefEMAIL, and PrefMAIL). We have no theoretical expectations for the effect of channel preference on repurchase, but because underlying curvilinearity can bias tests of interactions (e.g., Cortina 1993), we examined both main and quadratic terms to ensure that unexpected nonlinear relationships did not emerge as a significant interaction effect. None of the quadratic terms were significant.

Endogenous independent variables. Three independent variables capture the volume of relational communication the firm sent to its customers by telephone (PHONE), e-mail (EMAIL), and mail (MAIL). We determined the number of contacts according to the date of each contact in each quarter of the firm's customer contact database. We mean-centered the contact measures to facilitate interpretation of the quadratic and interaction effects.

Model Specification

Hausman (1978) tests confirmed that the three relational communication volume measures were endogenous. To control for this endogeneity, we estimated a simultaneous system of four equations for each of the endogenous variables. We specified the dependent variable (repurchase visits or spending) equation as follows:

$$\begin{aligned}\mathrm{DV}_{ij} = {} & \alpha_0 + \alpha_1\mathrm{TIME} + \alpha_2\mathrm{TIME}^2 + \alpha_3\lambda_i \\ & + \alpha_4\mathrm{lagSPEND}_i + \alpha_5\mathrm{lagVISIT}_i + \alpha_6\mathrm{WW}_i + \alpha_7\mathrm{VEH}_i \\ & + \alpha_8\mathrm{PrefPHONE}_i + \alpha_9\mathrm{PrefEMAIL}_i + \alpha_{10}\mathrm{PrefMAIL}_i \\ & + \alpha_{11}\mathrm{PHONE}_i + \alpha_{12}\mathrm{EMAIL}_i + \alpha_{13}\mathrm{MAIL}_i \\ & + \alpha_{14}\mathrm{PHONE}_i^2 + \alpha_{15}\mathrm{EMAIL}_i^2 + \alpha_{16}\mathrm{MAIL}_i^2 \\ & + \alpha_{17}\mathrm{PHONE}_i \times \mathrm{EMAIL}_i + \alpha_{18}\,\mathrm{PHONE}_i \times \mathrm{MAIL}_i \\ & + \alpha_{19}\,\mathrm{EMAIL}_i \times \mathrm{MAIL}_i + \alpha_{20}\mathrm{PrefPHONE}_i \times \mathrm{PHONE}_i \\ & + \alpha_{21}\mathrm{PrefEMAIL}_i \times \mathrm{EMAIL}_i + \alpha_{22}\mathrm{PrefMAIL}_i \\ & \times \mathrm{MAIL}_i + e_{i1},\end{aligned}$$

where the time subscript t is implied for all variables and lag indicates that the measure was taken from the quarter before the dependent measure observation (i.e., t – 1). In addition,

DV_{ij} = customer i's quarterly response,
j = repurchase visits or spending,
TIME = quarter from 1 to 12,
λ_i = selection control factor for customer i,
SPEND = quarterly repurchase spending by customer i,
VISIT_i = number of quarterly repurchase visits by customer i,
WW_i = amount of warranty work completed for customer i,
VEH_i = number of vehicles serviced for customer i,
$\mathrm{PrefPHONE}_i$ = customer i's self-reported preference for the telephone channel,
$\mathrm{PrefEMAIL}_i$ = customer i's self-reported preference for the e-mail channel,
$\mathrm{PrefMAIL}_i$ = customer i's self-reported preference for the mail channel,
PHONE_i = number of quarterly telephone contacts targeting customer i,
EMAIL_i = number of quarterly e-mail contacts targeting customer i,
MAIL_i = number of quarterly mail contacts targeting customer i, and
e_{i1} = autoregressive error term.

For the three endogenous relational communication volume equations, we used exogenous, lagged variables as predictor variables:

$$\begin{aligned}\mathrm{CV}_{ik} = {} & \beta_0 + \beta_1\mathrm{TIME} + \beta_2\mathrm{TIME}^2 + \beta_3\mathrm{QUARTER2} \\ & + \beta_4\mathrm{QUARTER3} + \beta_5\mathrm{QUARTER4} + \beta_6\mathrm{lagSPEND}_i \\ & + \beta_7\mathrm{lagSPEND}_i^2 + \beta_8\mathrm{lagVISIT}_i + \beta_9\mathrm{lagVISIT}_i^2 \\ & + \beta_{10}\mathrm{WW}_i + \beta_{11}\mathrm{VEH}_i + \beta_{12}\mathrm{lagPHONE}_i + \beta_{13}\mathrm{lagPHONE}_i^2 \\ & + \beta_{14}\mathrm{lagEMAIL}_i + \beta_{15}\mathrm{lagEMAIL}_i^2 + \beta_{16}\mathrm{lagMAIL}_i \\ & + \beta_{17}\mathrm{lagMAIL}_i^2 + \beta_{18}\mathrm{lagPHONE}_i \times \mathrm{lagEMAIL}_i \\ & + \beta_{19}\mathrm{lagPHONE}_i \times \mathrm{lagMAIL}_i + \beta_{20}\mathrm{lagEMAIL}_i \\ & \times \mathrm{lagMAIL}_i + \beta_{21}\mathrm{HI}_i + \beta_{22}\mathrm{HI}_i^2 + \beta_{23}\mathrm{lagMOVE}_i + e_{ij2},\end{aligned}$$

where

CV_{ik} = communication volume for customer i through channel k = telephone, e-mail, and mail, QUARTER2, 3, and 4 = dummy variables to control for programmatic seasonal changes in communication volume,

HI_i = annual household income of customer i, and

$MOVE_i$ = dummy variable indicating that customer i had moved to a new home address

We used full-information maximum likelihood analysis to estimate the system of equations (Chow 1964) We examined five hierarchical models to assess the robustness of individual results and overall fit of each model (see Tables 3 and 4) To explore whether multicollinearity might be biasing the estimates, we examined the condition numbers in each model, none exceeded 15, which is well below the level that would indicate potential problems (Greene 1990)

Model Selection

The analyses produced similar empirical results for both repurchase visits (Table 3) and repurchase spending (Table 4) For expositional brevity, we report results for the analyses using repurchase spending as the dependent variable We used the Bayesian information criterion (BIC) to assess overall model fit Model 1 was a baseline model that did not include quadratic or interaction terms In Model 2, we added the three relational communication volume quadratic terms that test H_1 Applying generally accepted standards for model fit (Kass and Raftery 1995), we can conclude that the addition of the relational communication volume quadratic terms (Model 2) results in very strong improvement in fit (Table 4, ΔBIC = 395 6)

We then compared the BIC for Models 3–5 with that for Model 2 In Model 3, we added the three two-way relational communication volume interactions that test H_2 We also examined higher-order terms to fully explore how the ideal point shifts in the presence of two-way interaction effects Specifically, we considered the three-way interaction among telephone, e-mail, and mail contact volume, which assesses whether the total volume of communication through all three channels significantly altered the ideal

TABLE 3
Simultaneous Equation Results for Repurchase Visits

			Model 1	Model 2	Model 3	Model 4	Model 5
Intercept			1 04***	1 09***	1 06***	1 09***	1 04***
Time			– 01*	– 01**	– 01***	– 01**	– 01***
Time²			– 01***	– 01***	– 01***	– 01***	– 01***
Selection control factor			– 09***	– 08***	– 08***	– 08***	– 08***
Lagged spending			– 00	– 00	– 00	– 00	– 00
Lagged visits			02***	03***	03***	03***	03***
Amount of warranty work			18***	19***	19***	19***	19***
Number of vehicles			07***	08***	08***	08***	08***
Main Effects							
Telephone preference			03***	03***	02***	05***	04***
E-mail preference			- 00	- 00	00	00	00
Mail preference			– 01*	– 01*	– 01*	– 01*	– 01*
Telephone contacts			03*	04**	02	04**	02*
E-mail contacts			08***	09***	04***	09***	04***
Mail contacts			16***	15***	14***	15***	14***
Volume Quadratic Effects							
Telephone contacts²	H1a	–		– 01***	– 01***	– 01***	– 01***
E-mail contacts²	H1b	–		– 01***	– 01***	– 01***	– 01***
Mail contacts²	H1c	–		– 01***	– 01***	– 01***	– 01***
Volume Interactions							
Telephone contacts × e-mail contacts	H2a	+/–			– 02***		– 02***
Telephone contacts × mail contacts	H2b	+/–			00		00
E-mail contacts × mail contacts	H2c	+/–			– 02***		– 02***
Telephone contacts² × e-mail contacts					01***		01***
Mail contacts² × e-mail contacts					002***		002***
Preference × Volume Interactions							
Telephone preference × phone contacts	H3a	+				01***	01***
E-mail preference × e-mail contacts	H3b	+				01**	01**
Mail preference × mail contacts	H3c	+				- 00	– 00
Telephone preference × phone contacts²						– 004**	– 003**
Model Fit							
R²			42	46	46	46	47
BIC			170,212 2	169,849 2	169,731 7	169,835 0	169,722 7
ΔBIC (compared with Model 1)				363 0	480 4	377 2	489 4
ΔBIC (compared with Model 2)					117 5	14 2	126 5

*$p<$ 05

**$p<$ 01

***$p<$ 001 (one-tailed t-tests for directional hypotheses, two-tailed for nondirectional hypotheses)

TABLE 4
Simultaneous Equation Results for Repurchase Spending

			Model 1	Model 2	Model 3	Model 4	Model 5
Intercept			3 51***	3 68***	3 54***	3 67***	3 53***
Time			– 01	– 01*	– 02**	– 01*	– 02**
Time^2			– 04***	– 03***	– 03***	– 03***	– 03***
Selection control factor			– 22***	– 20***	– 20***	– 20***	– 20***
Lagged spending			00	00	00	00	00
Lagged visits			05***	07***	06***	07***	06***
Amount of warranty work			50***	51***	51***	51***	51***
Number of vehicles			18***	19***	19***	19***	19***
Main Effects							
Telephone preference			10***	09***	08***	17***	15***
E-mail preference			00	- 01	- 01	00	01
Mail preference			– 02	– 03	– 02	– 02	– 02
Telephone contacts			11**	14***	07	15**	08*
E-mail contacts			26***	32***	16***	32***	15***
Mail contacts			58***	54***	48***	53***	48***
Volume Quadratic Effects							
Telephone contacts^2	H1a	–		– 04***	– 03***	– 04***	– 03***
E-mail contacts^2	H1b	–		– 04***	– 03***	– 04***	– 03***
Mail contacts^2	H1c	–		– 04***	– 03***	– 04***	– 03***
Volume Interactions							
Telephone contacts × e-mail contacts	H2a	+/–			– 08***		– 08***
Telephone contacts × mail contacts	H2b	+/–			– 01		– 01
E-mail contacts × mail contacts	H2c	+/–			– 06***		– 07***
Telephone contacts^2 × e-mail contacts					02***		02***
Mail contacts^2 × e-mail contacts					01***		01***
Preference × Volume Interactions							
Telephone preference × phone contacts	H3a	+				04***	04***
E-mail preference × e-mail contacts	H3b	+				02*	02**
Mail preference × mail contacts	H3c	+				00	– 00
Telephone preference × phone contacts2						– 02***	– 02**
Model Fit							
R^2			34	39	40	39	40
BIC			203,537 6	203,142 0	203,006 7	203,120 6	202,991 3
ΔBIC (compared with Model 1)				395 6	530 8	417 0	546 3
ΔBIC (compared with Model 2)					135 3	21 4	150 7

*$p < 05$
**$p < 01$
***$p < 001$ (one-tailed t-tests for directional hypotheses, two-tailed for nondirectional)

points, and the interactions between the channel volume quadratic terms, which assess whether each curvilinear channel volume relationship varied as a function of the volume in other channels (e g , Luo and Donthu 2006) We included two significant higher-order terms in Model 3, which produced strong improvement in fit over Model 2 (ΔBIC = 135 3)

For Model 4, we added the channel preference × channel volume interactions that test H_3 We also examined channel preference × channel volume quadratic interactions, which assess whether the curvilinear channel volume relationship varied as a function of channel preference We included one significant quadratic interaction term in Model 4, which resulted in a strong improvement in fit over Model 2 (ΔBIC = 21 4) A comparison of Model 4 with Model 3 offers no theoretical insight but is practically noteworthy The BIC and R-square values indicate that the relational communication volume interactions (Model 3) have greater predictive ability than do the channel preference × channel volume interactions (Model 4)

We estimated all theoretical relationships simultaneously in Model 5, which produced strong improvements in fit over Model 2 (ΔBIC = 150 7), Model 3 (ΔBIC = 15 4), and Model 4 (ΔBIC = 129 3) Therefore, we focus the remaining discussion on the Model 5 results

Results

The results for the control variables are logical The main effect and quadratic coefficient for time are both negative, suggesting a downward trend in repurchase over time The selection control factor is significantly negative, suggesting that nonrespondents repurchased more than respondents This might indicate that people with more free time (perhaps older and retired) were more willing to respond to the survey than were younger, working-age people with more vehicles in the household who subsequently repurchased more The coefficient for lagged spending is not significant, consistent with the idea that large automotive repair expenditures in one quarter might preclude large expenditures in the following quarter The coefficient for lagged visits is positive, indicating that relational customers return regularly for routine maintenance. The coefficients for warranty work and number of vehicles are also positive, indicating that more work performed under warranty and more cars in the household translate into greater spending on maintenance and repairs. We now examine the results related to our three research questions.

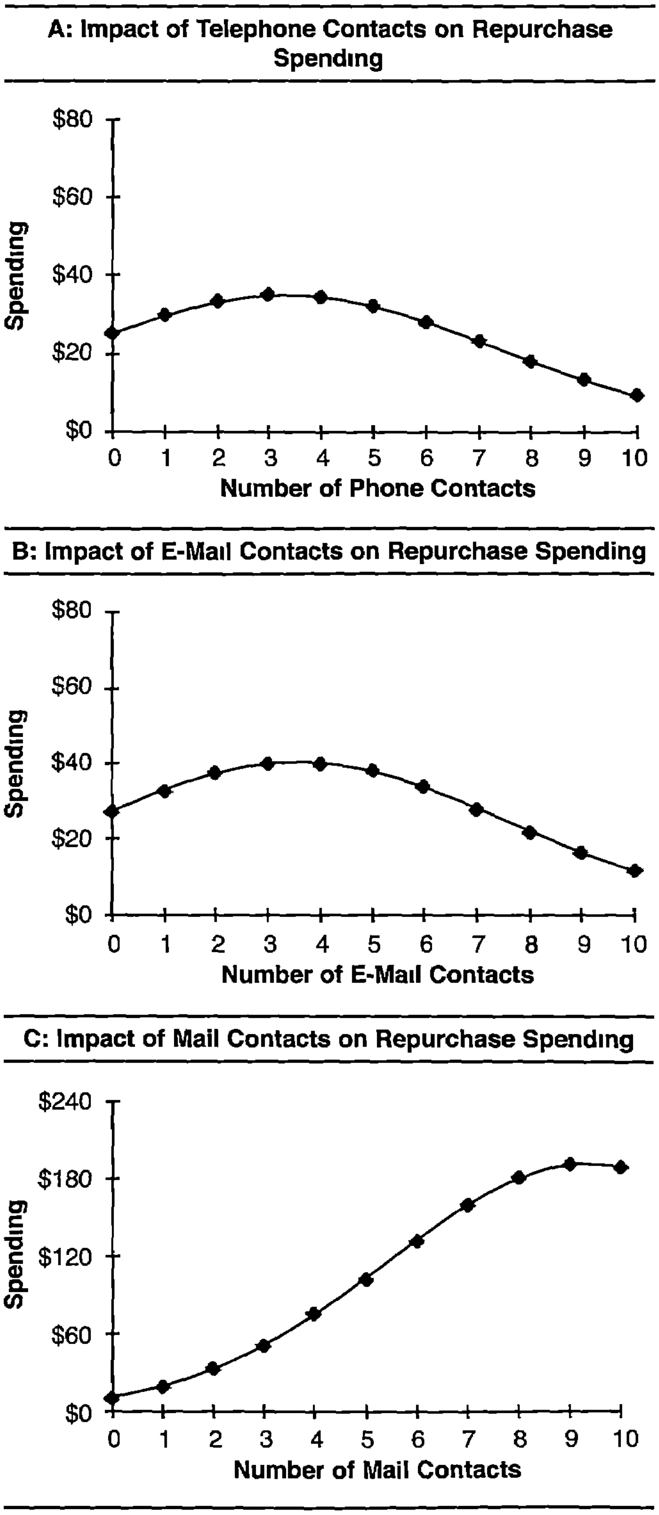
A positive main effect and a negative quadratic coefficient for contact volume through a given channel support the classic ideal point hypothesis (H_1). The results in Table 4 offer full support for H_1, because the main effect for communication volume is positive, and the quadratic coefficient is negative for telephone, e-mail, and mail contacts. These results indicate that the volume of relational communication through each channel has a positive impact on repurchase until the ideal point is reached. After the ideal point is exceeded, increasing volume has a negative effect on spending. Figure 1 illustrates the inverted U-shaped effects in the plots. For each channel, the first few contacts create a positive response. The positive response peaks at approximately three contacts for the telephone channel, between three and four contacts for the e-mail channel, and between nine and ten contacts for the mail channel.[1] Increasing volume beyond these points triggers negative reactance among customers, causing them to repurchase less.

A significant interaction effect for contact volume in two channels supports a shift in the ideal point (H_2). The results in Table 4 provide full support for two of the three predictions from H_2. The telephone contacts × e-mail contacts and e-mail contacts × mail contacts interactions are both significantly negative. These negative two-way interactions are consistent with a reactance theory perspective. The telephone contacts × mail contacts interaction coefficient also is negative but is only marginally significant using a two-tailed t-test ($p < .10$, t-value $= -1.85$) and is not significant in the repurchase visits analysis (Table 3).

We present graphs for the two significant cross-channel interaction effects in Figure 2. Panel A shows that customer response to e-mail contacts follows an inverted U-shaped pattern consistent with reciprocity followed by reactance for all levels of telephone contact. There is a clear shift in the ideal point for e-mail contacts as the number of telephone contacts increases. When there is one telephone contact, the ideal number of e-mail contacts is between five and six, but the ideal number of e-mail contacts drops to between two and three when there are three to five telephone contacts. This ideal point shift is consistent with cross-channel reactance, which leads to lower repurchase as the number of telephone and e-mail contacts jointly increases. The results in Panel B also indicate a shift in the ideal point consistent with reactance. When there is one mail contact, the ideal number of e-mail contacts is approximately five, but the ideal number of e-mail contacts drops to one when the number of mail contacts is five.

We also find support for H_3, which predicts that preference for a channel leads to more positive customer response to communications through that channel. Consistent with H_{3a}, the telephone channel preference × telephone contact volume coefficient is significantly positive. Figure 3, Panel A, shows that customer response follows the inverted U-shaped pattern that is consistent with reciprocity followed by reactance when customer preference ranges from moderate to high. There is no perceptible shift in the ideal point, which

FIGURE 1
Ideal Points for Impact of Relational Communication on Repurchase Spending



A: Impact of Telephone Contacts on Repurchase Spending

B: Impact of E-Mail Contacts on Repurchase Spending

C: Impact of Mail Contacts on Repurchase Spending

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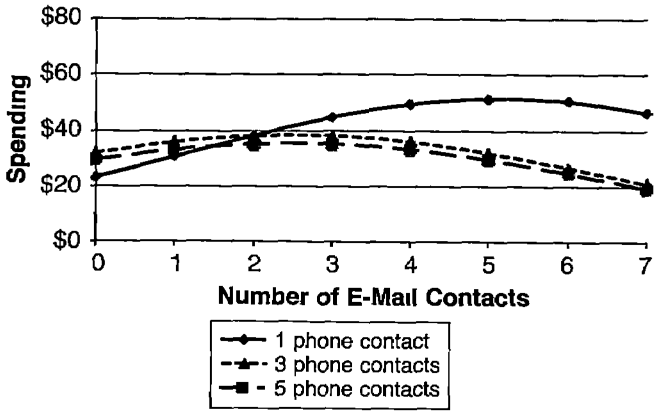
[1] All values in the graphs fall within the range of the data. Maximum values were 14 telephone, 14 e-mail, and 16 mail contacts per quarter.

FIGURE 2
Plotting Significant Volume Interaction Effects

A: Telephone × E-Mail Interaction Effect on Repurchase Spending



B: Mail × E-Mail Interaction Effect on Repurchase Spending

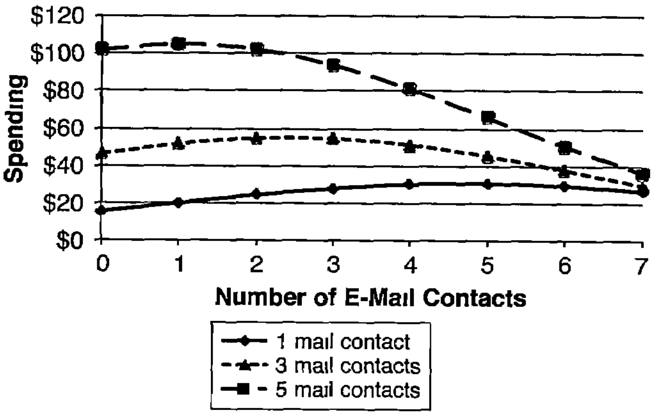
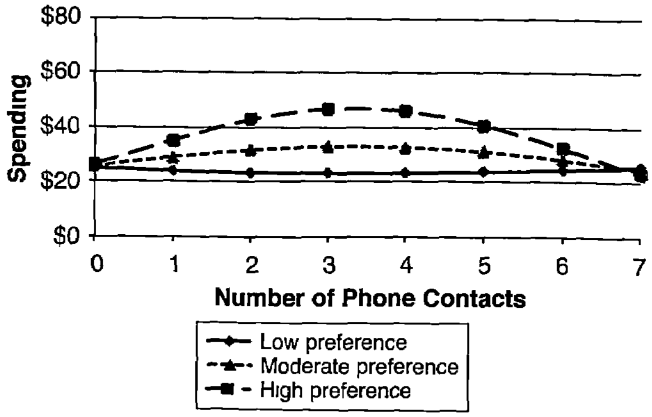
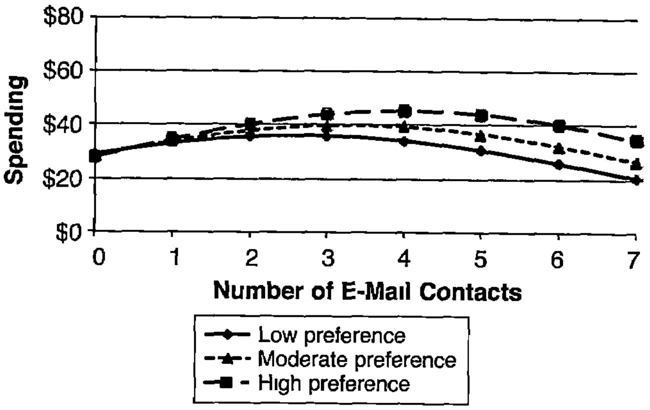


FIGURE 3
Plotting Significant Preference × Volume Interaction Effects

A: Telephone Preference × Telephone Contacts Interaction Effect on Repurchase Spending



B: E-Mail Preference × E-Mail Contacts Interaction Effect on Repurchase Spending



occurs at approximately three phone contacts. However, when preference for the channel is low, customers exhibit no response, either positive or negative, to any phone contacts.

H_{3b} receives support because the e-mail channel preference × e-mail contact volume coefficient is significantly positive. Panel B in Figure 3 shows a shift in ideal point. For customers who prefer the e-mail channel, repurchase is highest at five e-mail contacts; for customers who do not prefer that channel, repurchase is highest between two and three e-mail contacts.[2]

Discussion

This research was motivated by three key questions: In multichannel relational communication, is there an ideal volume? Are volume effects across channels additive or multiplicative, and if the effects are multiplicative, are the interactions positive or negative? and To what extent do customers' channel preferences moderate the relationship between communication volume and repurchase? We use the classic ideal point to conceptualize a response continuum that reflects reciprocity followed by reactance in response to multichannel communication volume. We extend this theoretical framework to explain volume interaction effects between channels and gauge the strength of channel preferences as moderating effects.

We provide empirical support for our framework by matching longitudinal customer transaction data with relational communication records and a large-scale customer survey. Our results offer concrete answers to the research questions and yield new insights into the unintended and potentially detrimental effects of multichannel relational communication First, the results indicate that there is an ideal volume of relational communication that varies across channels, after the ideal point is reached, additional communication generates reactance and increasingly negative customer response Second, we find that volume effects across channels are multiplicative and that, in contrast with prior studies that find synergies between channels, the interactions are negative, indicating that the ideal level of communication through one channel decreases as communication volume in other channels increases Specifically, our results show that combining e-mail contacts with either telephone or mail contacts generates reactance at a faster rate, the ideal volume of e-mail contacts decreases as the number of telephone or mail contacts increases Finally, we find that customers' preferences for the telephone and e-mail channels positively moderate the impact of communication volume through each of those channels, respectively

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[2] We also examined whether a "mismatch" between channel preference and channel volume would produce a negative shift in the ideal point. Three of the 6 mismatch interactions were significantly negative: telephone preference × mail volume, e-mail preference × telephone volume, and e-mail preference × mail volume. We do not include these terms in our analyses because inclusion did not change the results for the hypothesized relationships and because our measures of (lower/higher) preference for one channel do not necessarily translate into (higher/lower) preference for another channel. For example, sending a high volume of mail communication to someone who indicates a high preference for the telephone channel does not necessarily imply a mismatch, because that person might also have a high preference for the mail channel (r = .13; Table 2).

Theoretical Implications

Our conceptual framework shares some characteristics with the two-factor model of mass marketing repetition, as we noted previously Experimental studies have uncovered empirical support for the two-factor model, but there has been little support in field studies For example, in a study of television advertising, Tellis, Chandy, and Thaivanich (2000, p 43) conclude that their results "do not provide support for the two factor theory of advertising response [perhaps because] the effects of advertising frequency are too weak to register in a field setting "

One explanation for why negative consumer reactance may not manifest in a field study pertains to individual control over message processing If a consumer leaves the room during commercial breaks or fast-forwards through commercial breaks when watching prerecorded shows, reactance does not occur because the consumer has not been compelled to expend effort to process the advertisement Despite the widespread occurrence of message avoidance, the phenomenon has received little theoretical or empirical examination

Our results offer tantalizing insights into the role of individual control over message processing on response to communication volume Specifically, they suggest that reactance occurs more quickly in the telephone channel, more slowly in the e-mail channel, and much more slowly in the mail channel Furthermore, our findings suggest that reactance occurs more quickly when customers receive communication through multiple channels and occurs more slowly when customers receive communication through channels they prefer We speculate that these results pertain to the intrusiveness of the communication and the person's corresponding lack of control in avoiding the message

We take the perspective that the telephone channel is the most intrusive among the three channels we examined A telephone call disrupts the receiver in real time or, if a voice message is left, forces the receiver to process the message at least minimally to determine whether he or she wants to delete it As a result, telephone contacts prompt reactance after three contacts per quarter on average (Figure 1, Panel A) However, this average reactance point understates sensitivity toward the telephone channel Reactance is generated at even lower volumes when customers receive high levels of e-mail contacts For customers who prefer not to be contacted by telephone, the ideal point for telephone contacts is zero because these customers exhibit no positive response to the company's efforts to build a relationship through telephone communication On average, these customers also repurchase less than customers who are more receptive to telephone communication Thus, for the intrusive telephone channel in which message avoidance is difficult, reactance occurs early, and the subsequent negative effects are strong

Following this logic, we believe that the e-mail channel is somewhat less intrusive than the telephone channel because it does not necessarily disrupt the receiver in real time Messages can be reviewed and deleted whenever the receiver chooses, and the receiver has the ability to flag senders so that future messages go directly into a junk folder As a result, e-mail contacts prompt reactance after four contacts per quarter on average (Figure 1, Panel B) The intrusiveness of e-mail is amplified, however, for customers who receive higher volumes of communication by telephone (Figure 2, Panel A) or mail (Figure 2, Panel B)

It seems that respondents viewed the postal mail channel as the least intrusive and the easiest to ignore, which is consistent with prior reports that consumers view unsolicited e-mail as more intrusive than postal mail (Morimoto and Chang 2006) Apparently, the ease with which direct mail is disposed of reduces activation of negative reactance As a result, reactance did not appear until after nine mailings per quarter (Figure 1, Panel C) Given the high number of contacts required to trigger reactance and the relatively low message processing costs for direct mail, reactance to postal mail may be infrequent

We believe that the subsequent onset of reactance toward mail contacts may inform previous failures to uncover reactance toward advertisements in field studies The receiver's ability to retain control and avoid message processing attenuates the onset of reactance so that messages through channels such as television (in which the receiver has significant control over message processing) may rarely evoke negative reactance These inferences are consistent with experimental research demonstrating that an inverted U-shaped response occurs when participants perform deep processing of advertisements but does not occur with shallow processing (Nordhielm 2002)

The overall story that emerges is that customers react negatively to multichannel relational communication levels that exceed their ideal point This negative reactance is muted if customers can control and avoid exposure to the message Customers may perceive greater control over messages sent through channels that are less intrusive or for which they have greater preference Reactance is heightened if customers believe that control and avoidance is difficult, especially when messages come through multiple channels These findings underscore the importance of examining the effects of multichannel communication volume by considering the impact of specific channels, individually and in combination, rather than aggregate volume Our findings also highlight the importance of considering individual customer characteristics, such as channel preference, that moderate the impact of relational communication on repurchase

Reconciling Empirical Findings

Our review of empirical studies examining the effect of relational communication on repurchase behavior indicates that a majority uncover effects consistent with reciprocity (see Table 1) Of the studies we examined, only one (i e , Prins and Verhoef 2007) reports a negative interaction effect consistent with reactance, and just three (i e , Drèze and Bonfrer 2008, Kumar, Venkatesan, and Reinartz 2008, Venkatesan and Kumar 2004) report ideal points consistent with reciprocity followed by reactance We offer several explanations for the prevalence of reciprocity effects

First, reactance effects may be attenuated in some contexts due to inertia or switching barriers For example, Verhoef (2003) and Rust and Verhoef (2005) report effects consistent with reciprocity in an insurance context that can be described as an ongoing, contractual service with designated renewal periods Generating reactance in a continuing service context, in which inertia and switching barriers are high, might require far higher communication volume than in contexts featuring repeated, noncontractual transactions, such as automobile service

Second, the theory, research design, and analysis in prior studies may not have considered curvilinear effects Cortina (1993, pp 917–18) notes that there is a "bias against nonlinear hypotheses" that leads to "complex, nonadditive models without consideration of possible nonlinear effects " Of the studies in Table 1 that report linear effects consistent with reciprocity, none reports the results of tests to explore whether the relationship between communication and repurchase might be curvilinear Thus, we cannot discern whether the underlying effects of communication were linear or curvilinear Given emerging evidence in support of an ideal point of communication, we encourage further research to assess curvilinear effects on repurchase explicitly by including quadratic terms

Third, including quadratic terms is especially important when examining interaction terms because underlying curvilinearity can bias tests of interaction effects (e g , Cohen 1978, Cortina 1993) Two prior studies examining cross-channel interactions have used empirical approaches that do not include quadratic terms, which may explain the variation in their findings, one reports a positive interaction consistent with reciprocity (Reinartz, Thomas, and Kumar 2005), and the other reports a negative interaction consistent with reactance (Prins and Verhoef 2007) Another explanation for this difference is Reinartz, Thomas, and Kumar's (2005) operationalization of cross-channel interactions as the number of times both types of communication occurred within the same month This operationalization creates a change in the intercept rather than a change in the slope for one independent variable as a function of another

Finally, uncovering curvilinear relationships consistent with an ideal point is sensitive to coarseness or range restrictions in measuring the independent variable (Russell and Bobko 1992) For example, Prins and Verhoef (2007) operationalize telephone communication as a dummy variable capturing whether any telephone contact occurred in a given month, restricting the independent variable to two levels (0, 1) cannot capture curvilinear effects De Wulf, Odekerken-Schroder, and Iacobucci (2001) measure customers' perceptions of firm communication using a seven-point Likert scale, which creates a ceiling in assessing the level of communication In contrast, studies supporting an ideal point use independent measures with unrestricted distributions, such as the number of contacts and number of days since the last contact (Drèze and Bonfrer 2008, Kumar, Venkatesan, and Reinartz 2008)

In summary, plausible theoretical, methodological, and substantive explanations exist for the prevalence of reciprocity effects in prior research, which should encourage additional research to try to understand when customers are likely to demonstrate reciprocity or reactance in response to relational communication

Managerial Implications

Increased access to individual-level customer information has accelerated the use of targeted, multichannel communication Despite significant financial investments, firms have surprisingly limited knowledge about how the simultaneous use of multiple communication channels affects customer response Our results can inform multichannel communication practice to strengthen customer relationships effectively without wasting firm resources

Managers should carefully identify which channels are most effective in reaching their customers and avoid the assumption that different communication channels exert equivalent effects As an example, the low cost per contact and quick execution of e-mail might encourage companies to increase the proportion of e-mail contacts, under the assumption that e-mail communication is equally effective Our industry partner increased the proportion of e-mail communication from 2% of total contacts in the first quarter to 10% in the twelfth quarter This increased allocation is not warranted if the e-mail channel is less effective than other channels in driving customer repurchase As Figure 1 illustrates, this firm's customers are far more responsive to mail contacts than to either telephone or e-mail contacts

To maximize repurchase and minimize the likelihood of negative customer reactance, managers should monitor total contact volume and explore how specific channel combinations may shift the ideal point Our results show that e-mail combines poorly with both telephone and mail contacts, producing a decline in customer spending (Figure 2, Panels A and B) Conversely, the absence of a negative interaction between telephone contacts and mail contacts suggests that customers respond better to this combination than to the other combinations

To exploit revealed channel preferences, firms should develop protocols that limit total communication through all channels and specify effective combinations of channels For example, the cross-channel interactions in our study point to two segments (1) customers who respond positively to traditional telephone and mail channels and (2) customers who respond positively to the technological e-mail channel To investigate the spending implications of targeting these segments, we used the coefficient estimates in Model 5 to simulate the impact of three relational communication strategies, holding all other independent variables at mean values

First, we examined the effect of using equal numbers of telephone and mail contacts but no e-mail contacts This strategy should generate positive reciprocity among customers who prefer telephone and mail contacts but negative reactance among those who prefer e-mail contacts Second, we examined the effect of using only e-mail contacts but no telephone or mail contacts This strategy likely generates positive reciprocity among customers who prefer e-mail contacts but negative reactance among those who prefer telephone and mail contacts Third, we examined the effect of using equal numbers of telephone, mail, and e-mail contacts, which likely generates reactance from both customer segments

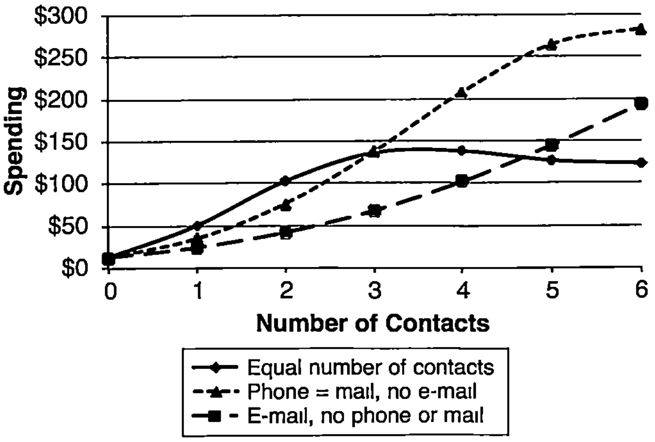
As Figure 4 shows, when the number of contacts is less than three, customers respond most positively to equal numbers of contacts across all three channels However, negative reactance appears after the number of contacts through each channel reaches four, and spending subsequently decreases Customer spending is actually higher in response to six e-mail contacts and no telephone or mail contacts than it is in response to five e-mail, five telephone, and five mail contacts combined This finding reinforces the results that indicate negative interactions between e-mail and telephone contacts and between e-mail and mail contacts (Figure 2, Panels A and B)

Customer spending is highest in response to a strategy that combines an equal number of telephone and mail contacts (but no e-mail), peaking at nearly $300 when the company sends six contacts through each channel These results suggest that the telephone and mail channels may exert complementary, independent effects on customer repurchase (Voss, Godfrey, and Seiders 2010)

Limitations and Further Research

This research has several limitations Our study focuses on repurchase visits and spending as the outcome measures in a single purchase category Further research should consider the extent to which multichannel relational communication triggers reactance with respect to other purchase outcomes, including share of wallet, interpurchase time, cross-buying, and customer defection, as well as in other purchase categories Although we expect to find similar patterns of results across outcomes, we anticipate that customer response to volume of communication, individual communication channels, and specific combinations of channels may vary across industries The automotive service context represents a low-involvement, utilitarian purchase category in which inertia may play a significant role in repurchase behavior Studies should assess whether reactance becomes manifest at higher or lower volumes of communication in high-involvement or hedonic purchase categories in which the role of habituation is less prominent

FIGURE 4
Simulated Results of Three Relational Communication Strategies



Further research should also explicate different relational communication effects in business-to-business (B2B) versus business-to-consumer settings (B2C) For example, the negative interactions between channels in our research contradict prior findings that support a positive interaction between channels in a B2B context (Reinartz, Thomas, and Kumar 2005) B2B contexts may not elicit negative reactance because the perceived invasiveness of relational communication is not activated in a commercial setting In B2B contexts, multichannel communication may be viewed as a normal aspect of the business process, whereas in B2C contexts, customers may view this practice as an intrusion on their personal space and time We hope that our study motivates further research that offers additional insights into the dark side of relational communication efforts—research that identifies when enough is enough

APPENDIX
Measurement Details for Each Variable

Variable	Label	Operationalization	Data Source
Dependent Variables			
Repurchase spending	$SPEND_i$	Repurchase spending dollars by customer i during the current quarter	Transaction database
Repurchase visits	$VISIT_i$	Number of repurchase visits by customer i during the current quarter	Transaction database

APPENDIX
Continued

Variable	Label	Operationalization	Data Source
Control Variables			
Quarter	TIME	Current quarter, from 1 to 12	Transaction database
Lagged repurchase spending	lagSPEND_i	Repurchase spending dollars by customer i during the previous quarter	Transaction database
Lagged repurchase visits	lagVISIT_i	Number of repurchase visits by customer i during the previous quarter	Transaction database
Warranty work	WW_i	Repurchase spending dollars covered by warranty	Transaction database
Vehicle ownership	VEH_i	Number of vehicles owned by customer i	Transaction database
Household income	HI_i	Median household income reported in the 2000 census for customer i's zip code	Transaction database/census data
Moved address	MOVE_i	Dichotomous variable indicating whether customer i's address changed from the previous quarter (1 = yes, 0 = no)	Transaction database
Exogenous Independent Variables			
Telephone channel preference	PrefPHONE_i	Survey item I prefer SP[a] contact me by telephone	Survey
E-mail channel preference	PrefEMAIL_i	Survey item I prefer SP contact me by e-mail	Survey
Mail channel preference	PrefMAIL_i	Survey item I prefer SP contact through the mail	Survey
Endogenous Independent Variables			
Telephone contact volume	PHONE_i	Number of outgoing marketing contacts directed toward customer i by telephone	Contact records
E-mail contact volume	EMAIL_i	Number of outgoing marketing contacts directed toward customer i by e-mail	Contact records
Mail contact volume	MAIL_i	Number of outgoing marketing contacts directed toward customer i by mail	Contact records

[a] SP = Service provider

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Jongkuk Lee

The Alignment of Contract Terms for Knowledge-Creating and Knowledge-Appropriating Relationship Portfolios

Interfirm collaborative relationships for developing new products involve the two fundamental tasks of creating new knowledge and appropriating the newly created or current stocks of knowledge This study examines the alignment of two contract terms—form of resource integration (how partners integrate their resources) and form of equity sharing (whether partners are engaged in equity investment)—for knowledge-creating and knowledge-appropriating relationship portfolios By analyzing interfirm relationship agreements initiated in the pharmaceutical industry between 1990 and 2006, the author shows that knowledge-creating and knowledge-appropriating relationship portfolios benefit from different alignments of contract terms to address their unique concerns The author also shows that the appropriate alignments of contract terms are more critical for small firms than for large firms The results provide specific insights into the management of knowledge-creating and knowledge-appropriating relationship portfolios for developing a greater number of radical and incremental new products

Keywords contract terms, firm size, knowledge-appropriating relationship portfolio, knowledge-creating relationship portfolio, radical and incremental new products

Interfirm collaborative relationships are fundamentally reshaping the marketing strategies firms use to develop and introduce new products in technology-intensive markets (Wind and Mahajan 1997) Firms attempting to develop new products often collaborate with various partners such as innovative firms with expertise in research and development (R&D) (Ganesan, Malter, and Rindfleisch 2005, Rindfleisch and Moorman 2001, Sivadas and Dwyer 2000, Wuyts, Dutta, and Stremersch 2004) or enterprise customers with market information (Bonner and Walker 2004, Fang 2008, Kristensson, Gustafsson, and Archer 2004) The increasing use of collaborative relationships calls for attention to be paid to the contract terms used for these relationships (Ghosh and John 1999, 2005) because "contract terms might facilitate or hinder particular outcomes" (Ghosh and John 2005, p 346)

The interfirm collaborative relationships established to develop new products have the two fundamental tasks of creating and appropriating knowledge (Jap 2001, Nickerson and Zenger 2004, Quinn, Jordin, and Zien 1997) Knowledge-creating relationships refer to interfirm collaborative relationships that involve the attainment of new technological knowledge, and knowledge-appropriating relationships refer to interfirm collaborative relationships that involve the transfer and use of the newly created or current stocks of technological knowledge to develop specific applications Knowledge creation and knowledge appropriation reflect different objectives that firms pursue through interfirm collaborative relationships (Koza and Lewin 1998) Firms explore opportunities for fundamental breakthroughs in technologies or products by forming knowledge-creating relationships, whereas they pursue opportunities to exploit current technologies or products by forming knowledge-appropriating relationships For example, Merck formed a knowledge-creating relationship with Alnylam Pharmaceuticals "to advance RNAi technology, which uses a natural biological mechanism to inhibit the expression of disease-causing genes and viruses" (PR Newswire 2003) Merck also initiated a knowledge-appropriating relationship with Sumitomo Pharmaceuticals "to collaborate on SM-13496 (lurasidone), an atypical antipsychotic compound discovered by Sumitomo and currently in Phase II development for the treatment of schizophrenia" (Business Wire 2005) However, the appropriate contract terms for the relationships initiated for these different objectives (i e , knowledge creation and knowledge appropriation) have yet to be examined

Furthermore, given the complexity and uncertainty associated with innovations in the high-tech industries, recent research has emphasized that the relationship portfolio is a relevant unit of analysis for examining interfirm collaboration in new product development (Faems, Van Looy, and Debackere 2005, Powell, Koput, and Smith-Doerr 1996, Wuyts, Dutta, and Stremersch 2004) However, little is known about appropriate contract terms for the relationship portfolio At the individual relationship level, previous studies have emphasized contract terms that can facilitate effective resource integration and incentive alignments among partners (Dyer and Singh 1998, Hoetker and

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Mellewigt 2009, Jap 2001, Jap and Ganesan 1999) However, firms face more complicated needs at the relationship portfolio level because they also must maintain some degree of flexibility in searching for alternative partners with new technological or market opportunities (Uzzi 1997) That is, factors that determine the outcomes of the relationship portfolio might differ from those that determine the outcomes of individual relationships (Gulati, Nohria, and Zaheer 2000) Therefore, it is of paramount importance to examine contract terms at the relationship portfolio level

To address these research gaps, I consider two specific contract terms relevant to collaborative relationships that involve technological knowledge (Gulati and Singh 1998, Kalaignanam, Shankar, and Varadarajan 2007) form of resource integration (how partners integrate their resources) and form of equity sharing (whether partners are engaged in equity investment for sharing ownership) I examine alignments of these two contract terms to manage the relationship portfolio This study addresses two specific questions (1) How do alignments of these two particular contract terms facilitate or hinder the outcomes of knowledge-creating and knowledge-appropriating relationship portfolios? and (2) What moderates the effect of contract term alignments on the outcomes of the knowledge-creating and knowledge-appropriating relationship portfolios?

By elaborating on the characteristics of knowledge creation and knowledge appropriation, I propose that knowledge-creating and knowledge-appropriating relationship portfolios benefit from different alignments of contract terms to address their unique concerns I also propose that the size of the focal firm (i e , amount of internal resources) moderates the effect of contract term alignments on the outcomes because internal resources provide the capability of absorbing external resources and they become a source of flexibility (Lin, Haibin, and Demirkan 2007, Park, Chen, and Gallagher 2002) For the outcomes of the relationship portfolio, I examine the number of new products that a firm introduces (Rothaermel 2001, Wuyts, Dutta, and Stremersch 2004) In particular, I distinguish between radical and incremental new products, given the importance of radical new products compared with incremental new products to the profitability and long-term survival of firms (Sorescu, Chandy, and Prabhu 2003, Sorescu and Spanjol 2008, Wuyts, Dutta, and Stremersch 2004) Radical new products refer to products that incorporate a substantially different technology and that have the potential to provide a substantial increase in customer benefits compared with existing products in the industry (Chandy and Tellis 1998), whereas incremental new products refer to products that do not meet one or both of these conditions (Wuyts, Dutta, and Stremersch 2004)

An analysis of interfirm relationship agreements initiated in the pharmaceutical industry shows that a firm's knowledge-creating relationship portfolio leads to a greater number of radical new products when contract terms are aligned in a way that achieves a compromise between the need for coordination and the need for search flexibility Otherwise, the knowledge-creating relationship portfolio tends to produce only incremental new products despite its potential for more fundamental breakthroughs In contrast, a firm's knowledge-appropriating relationship portfolio leads to a greater number of incremental new products when contract terms are determined in a way that minimizes the cost of initiating and enforcing the contract terms This study also shows that appropriate alignments of the contract terms are more critical for small firms than for large firms

The findings of this study contribute to the literature on relationship marketing and new product development in three important ways First, this study extends the understanding of interfirm relationships for new product development by distinguishing between knowledge creation and knowledge appropriation as two fundamental tasks in the collaborative new product development In particular, this study reveals that a difference exists in the appropriate contract term alignments for knowledge-creating and knowledge-appropriating relationship portfolios Second, a primary interest of interfirm relationship studies is to identify the appropriate contract terms for the specific tasks at hand (Ghosh and John 1999, 2005, Heide 1994, Jap 2001) However, this study also reveals that the size of a firm serves as a boundary condition for the effectiveness of contract term alignments in the firm's management of its relationship portfolio Third, this study contributes to the new product marketing literature by showing that contract terms can change the types of new products (i e , radical vs incremental) developed from collaborative relationship portfolios, not only the number of new products

Knowledge-Creating and Knowledge-Appropriating Relationships

Through knowledge-creating relationships, firms explore new opportunities for technological breakthroughs (Jap 2001, Rothaermel and Deeds 2004) However, firms that rely on a portfolio of knowledge-creating relationships for new product development face two fundamental challenges On the one hand, technological know-how accumulated through knowledge-creating relationships is often tacit and difficult to document, which causes difficulty in transfer (Hansen 1999, Zander and Kogut 1995) Moreover, technological breakthroughs are typically created by integrating various interrelated technologies rather than by using stand-alone technologies (Teece 1986, Winter 1987) This requires a comprehensive understanding of a larger system in which various technological components are integrated (Iansiti and West 1997, John, Weiss, and Dutta 1999) Therefore, firms that rely on the interfirm relationship portfolio for knowledge creation are likely to face a transfer problem The firms might have difficulty in moving complex knowledge from their partners and incorporating it into their own innovation efforts (Hansen 1999) On the other hand, a knowledge-creating relationship portfolio involves a high level of uncertainty In collaborating to create new knowledge, technologies are still developing and are less mature, and it is often difficult to pinpoint the exact knowledge relevant to the project at hand (Becker and Lillemark 2006, Stremersch and Dyck 2009) Accordingly, continuous efforts are needed to search for alternative partners with new technological opportunities (Hansen 1999, Uzzi 1997)

Therefore, firms that pursue new product development through a portfolio of knowledge-creating relationships face two different needs, as summarized in Table 1 (1) to facilitate coordination with partners for the effective transfer of complex knowledge and (2) to maintain search flexibility in response to technological uncertainty The literature on interorganizational relationships suggests that firms must closely cooperate with partners, such as through joint R&D (Hansen 1999), and must develop diverse governance mechanisms, such as trust, norms, or ownership sharing, to coordinate the transfer of complex knowledge and minimize the opportunistic behavior of partners (Heide 1994, Rindfleisch 2000) However, these efforts aimed at effective coordination tend to undermine a firm's flexibility in searching for alternative R&D partners or technological opportunities (Colombo 2003, Folta 1998, Folta and Miller 2002) That is, for the knowledge-creating relationship portfolio, as Bidault and Cummings (1994) and Sivadas and Dwyer (2000) point out, firms likely face a fundamental tension between "the logic of partnering," which requires more administrative mechanisms to manage the interorganizational relationships, and "the logic of innovation," which requires more flexibility in searching for innovative new ideas Accordingly, for successful new product development through the interfirm relationship portfolio, it is critical to design contract terms in a way that reduces such tension

In contrast, through the knowledge-appropriating relationship portfolio, firms pursue the development of specific applications of newly developed or current stocks of knowledge Resources combined for knowledge-appropriating relationships take more explicit and observable forms, such as patents or product prototypes, than the resources combined for knowledge-creating relationships (Rothaermel and Deeds 2004) That is, the tasks in knowledge-appropriating relationships are less complex and less uncertain, which causes fewer concerns about knowledge transfer and search flexibility Furthermore, developing complicated contract terms comes at a cost—namely, the financial and managerial resources required to set up and enforce the contract terms (Colombo 2003) For example, Sampson (2004a) shows that the use of more hierarchical governance forms, such as an equity-based joint venture compared with a purely contractual agreement, reduces the collaborative benefits of R&D relationships for relatively simple tasks Therefore, firms that pursue innovations through a knowledge-appropriating relationship portfolio benefit from contract terms that minimize the costs associated with setting up and enforcing the contract terms, as summarized in Table 1 In short, collaborative interfirm relationship portfolios initiated for these different objectives involve different concerns that should be addressed by using the appropriate contract terms

Contract Terms

Given the central role of knowledge-based resources in new product development, the nature of the partners' contributions when integrating their resources has been examined as a critical determinant of successful new product development (Fang 2008, Kalaignanam, Shankar, and Varadarajan 2007, Park and Russo 1996) In particular, previous research has distinguished between two specific forms of resource integration scale and link resource integration (Hennart 1988) In scale resource integration, partners pool their resources by performing the same functions jointly in the value chain In link resource integration, partners collaborate without resource pooling by performing different functions in the value chain (Kalaignanam, Shankar, and Varadarajan 2007) In this study, which focuses on forming interfirm relationships for new product development, scale resource integration specifically refers to pooling technological resources for joint R&D, and link resource integration refers to one party performing R&D for the other party

At the same time, the choice of equity sharing or nonequity sharing has been examined as a key decision for initiating interfirm relationships that involve knowledge-based resources (Gulati and Singh 1998, Pisano 1989, Sampson 2004a) Equity sharing refers to forming an interfirm relationship agreement that involves ownership sharing, such as acquisition of minority shareholdings or the development of an equity-based joint venture, whereas nonequity sharing refers to forming an interfirm relationship agreement that does not involve ownership sharing (Colombo 2003, Gulati and Singh 1998) Therefore, I examine the form of resource integration and the form of equity sharing as two key contract terms for knowledge-creating and knowledge-appropriating relationships

Form of Resource Integration

Scale resource integration involves extensive interactions and shared decision making (Killing 1988, Thompson 1967), which are essential for transferring complex knowledge (Hansen 1999) Moreover, by pooling resources among partners, scale resource integration generates

TABLE 1
Knowledge-Creating and Knowledge-Appropriating Relationship Portfolios

	Knowledge-Creating Relationship Portfolio	Knowledge-Appropriating Relationship Portfolio
Objective	•Pursues the creation of new technological knowledge	•Pursues the application of new or current technological knowledge
Task characteristics	•Involves more complex (tacit and interdependent) knowledge •Involves greater technological uncertainty	•Involves less complex (explicit and observable) knowledge •Involves less technological uncertainty
Determinants of Outcomes	•Balancing the effective transfer of complex knowledge with search flexibility in response to technological uncertainty	•Avoiding costs associated with setting up and enforcing the contract terms themselves

economies of scale and synergy in creating complex knowledge (Dussauge, Garrette, and Mitchell 2000) Therefore, a firm that uses scale resource integration for more relationships in its relationship portfolio will have greater advantages in creating and transferring complex knowledge However, scale resource integration entails more extensive organizational interdependence to coordinate the frequent interactions and shared decision making among partners (Carlile and Rebentisch 2003, Gerwin 2004, Killing 1988, Von Hippel 1994) Therefore, a firm's use of scale resource integration for more relationships in its relationship portfolio might constrain its flexibility in searching for alternative partners or new technological opportunities In contrast, the use of link resource integration for more relationships will provide more search flexibility by reducing the managerial resources committed to the relationship portfolio, even though it might deal poorly with complex knowledge

Form of Equity Sharing

Equity sharing creates a safeguard to protect relationship-specific investments by reducing the opportunistic behavior of partners, and it provides incentives for sharing knowledge-based resources among partners (Oxley 1997, Pisano 1989) Moreover, shared ownership through equity sharing can provide a command structure for effective communication and dispute resolution (Gulati and Singh 1998, Sampson 2004b) Therefore, a firm that uses equity sharing for more relationships in its relationship portfolio can better coordinate its collaborative activities However, the use of equity sharing comes at a significant cost associated with the investment required to set up a shared ownership structure and the risk of bureaucracy (Sampson 2004a) Moreover, because shared ownership through equity sharing increases the cost to terminate the relationship, it reflects a commitment to a more long-term relationship (Colombo 2003) Therefore, the use of equity sharing for more relationships in a firm's relationship portfolio tends to restrict the firm's flexibility in searching for alternative partners or new technological opportunities (Balakrishnan and Wernerfelt 1986) In contrast, the use of nonequity sharing for more relationships will provide more search flexibility, even though it can constrain the creation and transfer of complex knowledge

Therefore, previous findings have shown a fundamental trade-off between coordination and search flexibility that results from each contract term in managing the relationship portfolio Given the difficulty of achieving these two conflicting needs simultaneously through each contract term, as reviewed previously, this study investigates the alignment of these two contract terms to address unique concerns associated with the knowledge-creating and knowledge-appropriating relationship portfolios

Hypotheses

As Figure 1 illustrates, the forms of resource integration and equity sharing can be aligned in four different ways for individual relationships scale resource integration combined with equity sharing (SCALE/EQUITY), scale resource integration combined with nonequity sharing (SCALE/NONEQUITY), link resource integration combined with equity sharing (LINK/EQUITY), and link resource integration combined with nonequity sharing (LINK/NONEQUITY) I examine how the proportion of relationships using these different alignments in a firm's relationship portfolio affects the number of new products the firm develops Through a relationship portfolio, a firm accumulates technological knowledge that can improve its overall new product development capability, therefore, a more effective relationship portfolio will lead to a greater number of new products (Rothaermel 2001, Wuyts, Dutta, and Stremersch 2004)

FIGURE 1
Alignments of Resource Integration and Equity Sharing

		Form of Equity Sharing	
		Equity Sharing	Nonequity Sharing
Form of Resource Integration	Scale	SCALE/EQUITY (23%)	SCALE/NONEQUITY (38%)
	Link	LINK/EQUITY (10%)	LINK/NONEQUITY (29%)

Notes For the sample in this study, the percentage of relationship agreements using the corresponding contract term alignment is shown in parentheses

Alignment of Contract Terms for the Knowledge-Creating Relationship Portfolio

The knowledge-creating relationship portfolio entails two conflicting needs, namely, coordinating the transfer of complex knowledge and maintaining search flexibility in response to technological uncertainty I focus on two types of alignments of contract terms to meet these two conflicting needs (1) the proportion of each contract term alignment and (2) the diversity of contract term alignments

Proportion of each contract term alignment In the SCALE/EQUITY combination, the incentive alignment and command structure gained from equity sharing facilitate efficient resource pooling in scale resource integration (Gulati and Singh 1998) Therefore, using SCALE/EQUITY for more relationships in a firm's relationship portfolio will increase the firm's overall level of coordination for effective knowledge creation and transfer with its partners However, the firm's commitment to the current relationship portfolio through resource pooling and ownership sharing will constrain its flexibility in searching for alternative partners or new technologies (Fang 2008, Park and Russo 1996) In contrast, LINK/NONEQUITY involves neither resource pooling nor ownership sharing Therefore, using LINK/NONEQUITY for more relationships will decrease the firm's overall level of commitment to its current relationship portfolio, which will provide the firm with more search flexibility but will provide little benefit in coordinating the transfer of complex knowledge Therefore, using SCALE/EQUITY or LINK/NONEQUITY for more relationships in a firm's relationship portfolio will provide only coordination or search flexibility, but not both

In this study, I propose that the greater the proportions of the other two alignments (i e , SCALE/NONEQUITY and LINK/EQUITY) in a firm's knowledge-creating relationship portfolio, the better the firm will be at balancing coordination and search flexibility Such a compromise will facilitate the development of new products and lead to more new products In the SCALE/NONEQUITY combination, the limitation of nonequity sharing in coordinating the creation and transfer of complex knowledge will be complemented by scale resource integration, in which partners pool their resources for joint problem solving (Fang 2008, Park and Russo 1996) At the same time, the limitation of scale resource integration in maintaining search flexibility will be mitigated by nonequity sharing (Gulati and Singh 1998, Oxley 1997) Similarly, in the LINK/EQUITY combination, the limitation of link resource integration in coordinating the transfer of complex knowledge will be complemented by equity sharing, which provides an incentive alignment and command structure for close coordination among partners (Pisano 1989) The limitation of equity sharing in maintaining search flexibility will be relieved by link resource integration, which provides more search flexibility (Park and Russo 1996)

As such, even though SCALE/NONEQUITY and LINK/EQUITY are inferior to SCALE/EQUITY and LINK/NONEQUITY in dealing with either the need for coordination or the need for search flexibility, they will provide a better compromise between these two conflicting needs Such a compromise in a firm's knowledge-creating relationship portfolio will be particularly pertinent to the development of radical new products, rather than incremental new products, because the knowledge-creating relationship portfolio focuses on developing new knowledge that can lead to more fundamental breakthroughs Furthermore, such a compromise will enable a firm to explore substantially different technologies while facilitating the effective transfer and integration of those technologies to generate substantial customer benefits, both of which are essential components of radical innovations (Chandy and Tellis 1998) Therefore, I suggest that a firm will gain a greater number of radical new products the more it adopts SCALE/NONEQUITY or LINK/EQUITY for its knowledge-creating relationship portfolio Formally,

> H_1 The greater the proportion of relationships using (a) SCALE/NONEQUITY and (b) LINK/EQUITY in a firm's knowledge-creating relationship portfolio, the greater is the number of subsequent radical new products of the firm

Diversity of contract term alignments By focusing some collaborative relationships on meeting the need to coordinate the creation and transfer of complex knowledge, other relationships on meeting the need for search flexibility, and the remaining relationships on achieving a compromise between these two needs, firms are expected to meet their conflicting needs for the knowledge-creating relationship portfolio Indeed, the interorganizational relationship literature suggests that a mixture of relationships with different characteristics, such as arm's-length and embedded ties, is the ideal structure for the relationship portfolio (Uzzi 1997) Such a portfolio composed of diverse relationships works as an exchange system that offers unique opportunities that are not obtainable otherwise (Granovetter 1985) The same logic suggests that a mixture of relationships using different contract term alignments will produce a unique value for a firm's knowledge-creating relationship portfolio At the one extreme, SCALE/EQUITY provides the greatest level of coordination with the lowest level of search flexibility, whereas at the other extreme, LINK/NONEQUITY provides the greatest level of search flexibility with the lowest level of coordination, as discussed previously Finally, the other two alignments (i e , SCALE/NONEQUITY and LINK/EQUITY) provide unique benefits and costs between the two extreme cases Therefore, one strategy for achieving a compromise between the need for coordination and the need for search flexibility is to have a mixture of knowledge-creating relationships that uses these different alignments This facilitates the development of a greater number of radical new products, given the relevance of knowledge-creating relationships to radical new product development Thus

> H_2 The greater the diversity of contract term alignments used for a firm's knowledge-creating relationship portfolio, the greater is the number of subsequent radical new products of the firm

Alignment of Contract Terms for the Knowledge-Appropriating Relationship Portfolio

The nature of the relatively explicit tasks with a low level of uncertainty in knowledge-appropriating relationships, compared with knowledge-creating relationships, suggests that the knowledge-appropriating relationship portfolio will benefit little from contract term alignments that balance coordination and search flexibility I propose instead that the outcomes of the knowledge-appropriating relationship portfolio will mainly be driven by the cost of establishing and maintaining the contract terms (Sampson 2004a) Scale resource integration, despite its benefits in terms of knowledge creation and transfer, comes at a significant cost in terms of its increased organizational complexity, such as the decomposing and coordinating tasks for resource pooling among partners (Gulati and Singh 1998, Thompson 1967) For tasks that involve relatively explicit and observable knowledge, the benefits of scale resource integration can therefore be outweighed by the potential costs, which causes inefficiency in the use of scarce managerial resources Similarly, equity sharing is not necessary for relatively predictable tasks in knowledge-appropriating relationships, and the use of equity sharing can be dominated by its costs, such as the initial setup cost or the risks of bureaucracy (Colombo 2003, Sampson 2004a) Therefore, using LINK/NONEQUITY for more relationships makes the knowledge-appropriating relationship portfolio more efficient than using the other alignments This alignment is particularly pertinent to the development of incremental new products rather than radical new products because the knowledge-appropriating relationship portfolio focuses on improving existing product-market domains by building on existing complementary technologies or products among partners (Benner and Tushman 2002, He and Wong 2004, Rothaermel 2001) Therefore, contract terms for the knowledge-appropriating relationship portfolio affect the efficiency of incremental new product development Thus, adopting LINK/NONEQUITY for more knowledge-appropriating relationships leads to a greater number of incremental new products (i e , those that refine existing technologies or products or that provide a marginal increase in customer benefits) (Chandy and Tellis 1998, Ettlie, Bridges, and O'Keefe 1984)

H_3 The greater the proportion of relationships using LINK/NONEQUITY in a firm's knowledge-appropriating relationship portfolio, the greater is the number of subsequent incremental new products of the firm

Moderating Effect of Firm Size

Although contract terms are critical to managing interfirm collaborative relationships, the need for contract terms vary among firms depending on their ability to manage relationships without relying on such contract terms (Alvarez and Barney 2001) In particular, previous studies suggest that firm size (i e , the amount of internal resources) plays a significant role in gaining value from collaborative interfirm relationships (Kalaignanam, Shankar, and Varadarajan 2007, Lin, Haibin, and Demirkan 2007, Park, Chen, and Gallagher 2002) Firms with more internal resources can take advantage of at least two types of benefits in managing their relationship portfolio First, firm size reflects the extent of a firm's overall resource constraints (Hannan, Carroll, and Pólos 2003) Internal resources enable firms to be engaged in extensive searches while committing to current relationship partners (Park, Chen, and Gallagher 2002) For example, Lin, Haibin, and Demirkan (2007) show that larger firms benefit more from being engaged in both finding new partners and maintaining their current partners, whereas smaller firms benefit more from focusing on one or the other because of their lack of internal resources to manage both of them Therefore, internal resources become a buffer used to maintain flexibility in searching for alternative partners or new technological opportunities Therefore, the search flexibility of larger firms with more internal resources is less affected by the use of specific contract terms

Second, firms with more internal resources are more effective at absorbing their partners' technological knowledge because the internal resources provide the capacity to gain and assimilate knowledge from their partners (Cohen and Levinthal 1990) Furthermore, according to their resources and established positions in the marketplace, larger firms tend to have a greater ability to influence the process of implementing relationship agreements to secure their own interests (Ahuja 2000b, Park, Chen, and Gallagher 2002, Stuart 1998) In contrast, smaller firms have a greater difficulty in absorbing their partners' technological knowledge and securing their own interests Therefore, unlike large firms, small firms rely more on specific contract terms to ensure that knowledge is transferred effectively from their partners (Alvarez and Barney 2001)

These two benefits associated with the amount of internal resources suggest that the need for the appropriate contract terms is greater for small firms than for large firms At the same time, small firms suffer more from having inappropriate contract terms than large firms Therefore, the contract term alignments hypothesized previously for the knowledge-creating and knowledge-appropriating relationship portfolios are less critical for large firms than for small firms

H_4 The greater the size of a firm, the lower is the positive effect of (1) the proportion of relationships using SCALE/NONEQUITY, (2) the proportion of relationships using LINK/EQUITY, and (3) the diversity of contract term alignments in a firm's knowledge-creating relationship portfolio on the number of subsequent radical new products of the firm

H_5 The greater the size of a firm, the lower is the positive effect of the proportion of relationships using LINK/NONEQUITY in a firm's knowledge-appropriating relationship portfolio on the number of subsequent incremental new products of the firm

Research Methods

Research Context

I test the proposed hypotheses with data collected from the pharmaceutical industry I selected this context for two reasons First, the pharmaceutical industry is technology intensive, and collaborative interfirm relationships are widely used for new product development (Wuyts, Dutta, and Stremersch 2004) In particular, pharmaceutical firms have been collaborating extensively with biotechnology firms since the biotechnology revolution of the mid-1970s (Rothaermel and Thursby 2007) Second, the pharmaceutical industry provides rich documentation on interfirm collaboration activities (Stremersch and Dyck 2009) In particular, the clearly distinguished objectives of collaborative relationships, such as discovery and research, preclinical trials, clinical trials (Phase 1, 2, and 3), and U S Food and Drug Administration (FDA) approval, enable examination of knowledge-creating and knowledge-appropriating relationship portfolios (Filson and Morales 2006, Rothaermel and Deeds 2004)

Data Collection

I also use various secondary sources, such as Deloitte Recap, the FDA, and COMPUSTAT Pharmaceutical firms (Standard Industrial Classification Code 2834) that were incorporated before 1991 were identified from COMPUSTAT Relationship data for these firms are collected from Deloitte Recap, a commercial database of collaborative activities dedicated to the biotechnology and pharmaceutical industries This database provides detailed information relevant to this study, such as the objectives that the collaborative relationships were initiated to fulfill, the functional activities to be performed under the collaborative agreements, the way partners integrated their resources, and whether they shared equity as a part of the collaborative agreements For the number of new products, a list of new drugs approved by the FDA was collected from the FDA database The FDA specifies the review classification (i e , therapeutic potential) of each new drug application and the chemical type, which were used to distinguish between radical and incremental new drugs (FDA 2008, Wuyts, Dutta, and Stremersch 2004) Demographic and financial data on the focal firms were collected from COMPUSTAT On the basis of the aforementioned criteria, 78 firms were selected as focal firms for this study

To examine interfirm relationships for new product development, I focused the analysis on interfirm relationship agreements that included R&D as a part of the agreements In this study, I used relationship formation data from 1990 to 2006 and new product data up to 2007 Because it typically takes more than 10 years to complete preclinical and clinical tests and receive FDA approval in the pharmaceutical industry (DiMasi, Hansen, and Grabowski 2003, Pharmaceutical Research and Manufacturers of America 2010), this study used a 12-year window to create relationship portfolios, which would allow enough time for the interfirm relationships to result in new product outcomes (For a robustness check, I also test with 10- and 14-year windows, details are presented in the Appendix) Specifically, I use a 12-year window, from year t – 11 to year t, to create a relationship portfolio and measure the corresponding outcomes (i e , the numbers of radical and incremental new products) at year t + 1 For example, I used a relationship portfolio composed of relationships initiated from 1990 through 2001 to explain the number of new products approved in 2002 Therefore, I was able to test the yearly number of new products from 2002 to 2007, which resulted in a maximum of six observations for each focal firm After eliminating observations with missing values, I obtained 412 observations for this study

Consistent with previous studies (Hoang and Rothaermel 2005, McNamara and Baden-Fuller 2007, Rothaermel and Deeds 2004), this study classified relationship agreements as either knowledge-creating or knowledge-appropriating relationships on the basis of the objectives the interfirm relationships were initiated to fulfill These objectives were identified according to the new drug development stages in which the relationships were initiated Particularly in the pharmaceutical industry, relationships initiated in the discovery, research, or preclinical trial stage typically focus on creating new technological knowledge or a new capability, whereas relationships initiated in the clinical trial or FDA approval stage focus on developing applications or improving the efficiency or safety of new or existing drugs (McNamara and Baden-Fuller 2007, Rothaermel and Deeds 2004) Therefore, collaborative agreements initiated in the discovery, research, or preclinical trial stage were defined as knowledge-creating relationships, whereas collaborative agreements initiated in the clinical trial or FDA approval stage were defined as knowledge-appropriating relationships (Rothaermel and Deeds 2004)

Individual relationship agreements might differ in terms of the focal firm's commitment or investment level Deloitte Recap provides deal-size information for each relationship agreement The deal size typically encompasses up-front payments, milestone payments, research spending, equity purchases, and options Therefore, the deal size of a relationship agreement reflects the focal firm's level of investment in the relationship One would expect that relationship agreements with a greater deal size would have a greater effect on outcomes Therefore, I weighted each relationship established in a specific year according to its relative deal size compared with the average deal size of the relationships established in that year For relationship agreements established in a specific year with a missing value for deal size, I used the average deal size of the relationships established in that year I then measured relationship variables (which I describe subsequently) by applying the relative deal size For a robustness check, I also measured relationship variables without applying the relative deal size and found consistent results

Main Variables

Alignment of contract terms for knowledge-creating (knowledge-appropriating) relationships For the form of resource integration, interfirm relationships in which partners pooled their resources for R&D (e g , joint R&D) were considered to be using scale resource integration Otherwise, interfirm relationships in which only one partner performed R&D (e g , R&D outsourced by one party to the other party) were considered to be using link resource integration (Kalaignanam, Shankar, and Varadarajan 2007) For the form of equity sharing, interfirm relationships that included equity investment as a part of the relationship agreement, were considered to be using equity sharing, otherwise, interfirm relationships were considered to be using nonequity sharing, that is, a purely contractual agreement that does not rely on ownership sharing (Gulati and Singh 1998) On the basis of these two types of contract terms (i e , form of resource integration and form of equity sharing), the alignment of contract terms for each relationship agreement was classified into one of four alignments (1) SCALE/EQUITY, (2) SCALE/NONEQUITY, (3) LINK/EQUITY, or (4) LINK/NONEQUITY I then measured the proportion of each contract term alignment in firm i's knowledge-creating (knowledge-appropriating) relationship portfolio in year t from knowledge-creating (knowledge-appropriating) relationships that were initiated in the past 12 years, between year t – 11 and t

Diversity of contract term alignments I measured the diversity of contract term alignments in the knowledge-creating (knowledge-appropriating) relationship portfolio of firm i in year t using Equation 1 (Powell, Koput, and Smith-Doerr 1996, Wuyts, Dutta, and Stremersch 2004)

$$(1)\quad 1-\sum_{j=1}^{J}\left(\frac{n_{it,j}}{\sum_{j} n_{it,j}}\right)^{2},$$

where n_{it_j} is the number of times firm i uses contract term alignment j (i e , SCALE/EQUITY, SCALE/NONEQUITY, LINK/EQUITY, and LINK/NONEQUITY) in its knowledge-creating (knowledge-appropriating) relationship portfolio The portfolio was composed of knowledge-creating (knowledge-appropriating) relationships that were initiated in the past 12 years between year t – 11 and t The diversity of contract term alignments becomes 0 when a firm uses only one type of contract term alignment, and it becomes close to 1 as a firm uses more diverse contract term alignments for its relationship portfolio

Firm size Consistent with previous studies (Kalaignanam, Shankar, and Varadarajan 2007, Lin, Haibin, and Demirkan 2007), I measured firm size by the total assets (log-transformed), which indicate the amount of internal resources

Number of radical and incremental new products Consistent with previous studies (Wuyts, Dutta, and Stremersch 2004), this study measured the outcomes of the relationship portfolio according to the number of radical and incremental new drugs approved by the FDA each year When the FDA approves new drugs, it provides two types of information chemical type and review classification Of the eight different chemical type categories, only chemical type 1 represents active ingredients that have never been marketed, whereas the other chemical types represent existing active ingredients that have been marketed in the past (FDA 2008) The FDA also classifies new drugs into one of two categories in terms of their therapeutic potential priority or standard review drugs (FDA 2008) A priority review drug refers to "a drug that appears to represent an advance over an available therapy," whereas a standard review drug refers to "a new drug that appears to have therapeutic qualities similar to those of an already marketed drug" (FDA 2008) Therefore, new drugs labeled chemical type 1 and priority review drugs are defined as radical new drugs, which are drugs that incorporate a new technology and have great potential for customer need fulfillment (Chandy and Tellis 1998) New drugs that did not satisfy one or both of these conditions were defined as incremental new drugs (Wuyts, Dutta, and Stremersch 2004) The number of radical (incremental) new products of firm i in year t + 1 was then measured by the total number of radical (incremental) new drugs of firm i approved by the FDA in year t + 1

Control Variables

Relationship portfolio size I controlled for the effect of firms' relationship portfolio size by measuring the relationship portfolio size of firm i in year t according to the total number of relationships that firm i initiated in the past 12 years between year t – 11 and year t

Ratio of knowledge-creating to knowledge-appropriating relationships In addition to the size of the relationship portfolio, the relative focus of relationships on knowledge creation versus knowledge appropriation might affect the number of new products that the firm develops (Rothaermel 2001) Accordingly, I include the ratio of knowledge-creating relationships to knowledge-appropriating relationships in firm i's relationships that were initiated in the past 12 years between year t – 11 and t

Radical and incremental new product experience By accumulating expertise and infrastructure, firms will benefit from continuing the same type of new product development in the future (Greve 1999, Hannan and Freeman 1984) At the same time, the characteristics of a firm's past new product development reflect its strategic orientation, which might affect future new product development behavior (Gatignon and Xuereb 1997, Slater, Olson, and Hult 2006) In other words, firms that have consistently introduced radical (incremental) new products in the past are likely to have a strategic orientation toward and a routine for radical (incremental) new product development Therefore, I controlled for radical and incremental new product experience, as measured for each firm according to the number of radical and incremental new drugs approved by the FDA during the 3-year period before the 12-year window

R&D intensity The investment of resources in R&D activities is an important source of new product development I include R&D intensity to control for the effect of internal R&D investments on the number of new products developed (Lavie and Miller 2008, Lee, Lee, and Pennings 2001) The R&D intensity of firm i in year t was measured by the expenditure on R&D divided by the total assets of firm i in year t

U S firms In this study, the outcomes of a relationship portfolio were measured according to new drugs approved by the FDA Non-U S firms might operate under different conditions, compared with U S firms, when applying for and obtaining FDA approval for their new drugs Therefore, I controlled for whether a firm was a U S - or non-U S - headquartered firm

Empirical Model

The dependent variables, the numbers of radical and incremental new products, are count variables that take only nonnegative integer values Therefore, I used a panel Poisson approach (Hausman, Hall, and Griliches 1984) and the Hausman (1978) test to determine whether unobserved effects should be modeled as fixed or random effects There was no significant difference (p = 42 ~ 96), which indicates that the random-effects model provides more efficient estimations than the fixed-effects model In the random-effects Poisson model, the firm-specific effect, μ_i, which reflects firm-specific heterogeneity, is added to the model specification

$$(2)\ E(\text{new products}_{it}/X_{it-1}) = \exp[X_{it-1}(\beta + \mu_i)]$$

In this model, overdispersion is directly captured in the model by assuming that μ_i is drawn from the gamma distribution In the gamma distribution, the variance-to-mean ratio is no longer unity but $(1 + \alpha\lambda_{it})$, in which α is the reciprocal of the standard deviation of the heterogeneity distribution so that the ratio increases with λ_{it} (Hausman, Hall, and Griliches 1984) The random-effects Poisson models estimate α from the data and capture any overdispersion (Ahuja 2000a) At the same time, the random-effects model implies an equicorrelated covariance matrix and therefore takes a constant serial correlation of errors (i e , $\rho_{ts} = \rho$ for all $t \neq s$) into the model (Hausman, Hall, and Griliches 1984) Therefore, I estimated random-effects Poisson models to test the proposed hypotheses by using the "xtpoisson" procedure in Stata 11

However, serial correlations, if they exist, might follow different structures Therefore, I also tested a population-averaged Poisson model using the generalized estimating equation approach, which specifies how the average of a dependent variable of a subject changes with the independent variables while allowing for a more flexible serial correlation (Cui 2007, Zeger and Liang 1986) Specifically, I used the "xtgee" procedure in Stata 11 with the option that allows a first-order serial correlation of errors

Finally, to show the validity of this study, it is necessary to exclude the possibility of a reverse causal relationship, in which the choice of contract terms is driven by the types of intended new products (i e , radical vs incremental new products) Therefore, I examined the possibility of a reverse causal relationship as part of the robustness tests Detailed specifications for and results of the robustness tests appear in the Appendix

Results

Effect of the Alignment of Contract Terms on the Number of New Products

Table 2 presents descriptive statistics for the variables and their correlations Tables 3 and 4 present the effects of alignments of contract terms on the numbers of radical and incremental new products, respectively

Knowledge-creating relationship portfolio Model 2 in Table 3 indicates that the proportion of relationships using SCALE/NONEQUITY in a firm's knowledge-creating relationship portfolio has a positive effect on the number of radical new products of the firm ($\beta = 13\ 89, p < 05$), which supports H_{1a} However, the proportion of relationships that use LINK/EQUITY in a firm's knowledge-creating relationship portfolio has no significant effect on the number of radical new products of the firm ($\beta = -51$, not significant [n s]), which fails to support H_{1b} Model 2 also shows that the diversity of contract term alignments in the knowledge-creating relationship portfolio has a positive effect on the number of radical new products ($\beta = 13\ 12, p < 05$), which supports H_2

In terms of the moderating effect of firm size, Model 2 shows that the positive effects of SCALE/NONEQUITY and contract term alignment diversity on the number of radical new products are negatively moderated by firm size ($\beta = -2\ 75, p < 10$, and $\beta = -3\ 13, p < 05$, respectively), which supports H_{4a} and H_{4c} These results indicate that the alignment of contract terms tends to be more critical for small firms than for large firms For LINK/EQUITY, however, firm size has no significant moderating effect ($\beta = -21$, n s) Model 3 also tests the proposed hypotheses by using the population-averaged Poisson model to control for the serial correlations of errors that might exist in the data for this study The results are consistent with those from the random-effects Poisson model

Although not presented in the hypotheses, Model 5 in Table 4 shows that the diversity of contract term alignments in the knowledge-creating relationship portfolio, which has a positive effect on the number of radical new products as shown in Model 2, has a negative effect on the number of incremental new products ($\beta = -95, p < 05$) Therefore, the diversity of contract term alignments for a firm's knowledge-creating relationship portfolio seems to have the opposite effects on radical and incremental new products of the firm I discuss the implications of this finding in the "Discussion" section

Knowledge-appropriating relationship portfolio Model 5 in Table 4 shows that the proportion of relationships using LINK/NONEQUITY in a firm's knowledge-appropriating relationship portfolio has a positive effect on the number of incremental new products ($\beta = 93, p < 01$), which supports H_3 Furthermore, this positive effect is negatively moderated by firm size ($\beta = -29, p < 05$), which supports H_5 Model 8 tests the proposed hypotheses by using the population-averaged Poisson model and shows consistent results

Although not presented in the hypotheses, Model 5 shows that the diversity of contract term alignments in a firm's knowledge-appropriating relationship portfolio has a marginally positive effect on the number of incremental new products ($\beta = 90, p < 10$) A possible explanation is that even though knowledge-appropriating relationships involve less complexity and uncertainty compared with knowledge-creating relationships, the use of diverse contract term alignments might still work as an exchange system that creates value for the knowledge-appropriating relationship portfolio (Uzzi 1997) In addition, Model 2 shows that contract term alignments for the knowledge-appropriating relationship portfolio have no significant effect on the number of radical new products (for the proportion of LINK/NONEQUITY, $\beta = -44$, n s , for the diversity of contract term alignments, $\beta = -56$, n s), which confirms that contract term alignments for the knowledge-appropriating relationship portfolio are more relevant to the development of incremental new products than radical new products, as expected

Control Variables

Models 2 and 5 show that firm size, as measured according to total assets, has a positive effect on both radical and incremental new products ($\beta = 1\ 29, p < 05$, and $\beta = 46$, $p < 01$, respectively), which indicates that firms with more resources tend to introduce more new products The results reflect the characteristics of the pharmaceutical industry, in which new product developments require significant resource investments for a long period of time and there is a high risk of failure (McNamara and Baden-Fuller 2007, Stremersch and Dyck 2009) As Models 2 and 5 indicate, R&D intensity has a positive effect on the number of radical new products ($\beta = 2\ 82, p < 01$) but does not have a significant effect on the number of incremental new products ($\beta = -24$, n s), which suggests that intensive R&D investments will benefit the development of radical new products more than incremental new products

Regarding a firm's new product experience, Models 2 and 5 indicate that a firm's past experience with radical new products has a positive effect on the number of radical new products ($\beta = 38, p < 05$), whereas it has no significant effect on the number of incremental new products ($\beta = -07$, n s) In contrast, a firm's past experience with incremental new products has a positive effect on the number of incremental new products ($\beta = 05, p < 05$), whereas it has no significant effect on the number of radical new products ($\beta = -07$, n s) These results indicate the existence of expertise that firms accumulate through past new product development experience or the existence of a strategic orientation toward radical or incremental new products

TABLE 2
Descriptive Statistics and Correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1 2003	1 00																		
2 2004	– 18	1 00																	
3 2005	– 20	– 20	1 00																
4 2006	– 20	– 20	– 22	1 00															
5 2007	– 20	– 21	– 22	– 22	1 00														
6 Number of radical new products	02	05	03	– 05	00	1 00													
7 Number of incremental new products	– 01	00	– 04	05	– 03	17	1 00												
8 Firm size	– 03	00	02	01	02	26	54	1 00											
9 R&D intensity	06	– 03	– 03	– 03	08	– 05	– 20	– 59	1 00										
10 U S firms	– 01	– 01	01	02	00	– 11	– 27	– 34	15	1 00									
11 Radical new product experience	– 04	01	04	03	00	32	42	52	– 17	– 39	1 00								
12 Incremental new product experience	– 01	03	– 02	00	01	19	55	62	– 20	– 30	67	1 00							
13 Relationship portfolio size	– 02	01	00	01	03	32	51	70	– 25	– 29	59	56	1 00						
14 Ratio of knowledge-creating to knowledge-appropriating relationships	01	01	01	00	00	– 05	– 07	– 16	– 04	07	– 07	– 09	– 09	1 00					
15 Proportion of SCALE/NONEQUITY in the knowledge-creating relationship portfolio	– 04	– 03	– 01	07	09	14	– 03	02	– 02	– 09	06	01	11	04	1 00				
16 Proportion of LINK/EQUITY in the knowledge creating-relationship portfolio	06	02	– 03	– 08	– 09	– 08	– 05	– 16	22	– 14	– 03	– 07	– 11	– 10	– 43	1 00			
17 Diversity of contract term alignments in the knowledge-creating relationship portfolio	04	05	– 01	– 05	– 08	14	22	45	– 32	– 12	20	29	45	08	20	– 16	1 00		
18 Proportion of LINK/NONEQUITY in the knowledge-appropriating relationship portfolio	00	– 02	– 01	– 01	02	– 04	08	07	– 06	– 10	08	12	– 03	– 06	06	– 10	– 09	1 00	
19 Diversity of contract term alignments in the knowledge-appropriating relationship portfolio	02	– 01	– 03	00	00	14	31	46	– 03	– 31	30	35	50	– 30	– 05	04	10	02	1 00
M	15	16	17	18	19	07	51	6 51	31	88	30	1 16	23 35	12 03	40	13	41	37	35
SD	36	36	38	38	39	26	1 09	2 57	42	32	86	2 76	3 96	46 39	30	26	25	34	26

Notes N = 412

TABLE 3
Effect of the Alignment of Contract Terms on the Number of Radical New Products

Variables	Hypothesis	Model 1 (Random-Effects Model)		Model 2 (Random-Effects Model)		Model 3 (Population-Averaged Model)	
Control Variables							
Constant		–12 77***	(3 83)	–26 97***	(11 12)	–28 03***	(10 79)
2003		72	(84)	64	(85)	62	(87)
2004		81	(84)	70	(84)	65	(82)
2005		32	(84)	20	(86)	12	(84)
2006		– 44	(94)	– 55	(96)	– 62	(94)
2007		– 10	(88)	– 30	(90)	– 30	(88)
Firm size		51***	(19)	1 29**	(58)	1 46***	(59)
R&D intensity		1 93***	(80)	2 82***	(1 18)	3 02***	(1 20)
U S firms		41	(59)	08	(63)	04	(57)
Radical new product experience		34**	(19)	38**	(20)	39**	(19)
Incremental new product experience		– 05	(08)	– 07	(09)	– 07	(09)
Relationship portfolio size		00	(01)	00	(01)	00	(01)
Ratio of knowledge-creating to knowledge-appropriating relationships		– 01	(02)	– 02	(03)	– 02	(03)
Alignment of Contract Terms for the Knowledge-Creating Relationship Portfolio							
Proportion of SCALE/NONEQUITY	H_{1a}	5 77**	(2 79)	13 89**	(6 97)	14 23**	(6 66)
Proportion of LINK/EQUITY	H_{1b}	–1 55	(3 34)	– 51	(4 07)	–1 01	(4 00)
Diversity of contract term alignments	H_2	4 78*	(3 46)	13 12**	(7 10)	13 06**	(6 83)
Proportion of SCALE/NONEQUITY × firm size	H_{4a}			–2 75*	(1 72)	–2 89**	(1 67)
Proportion of LINK/EQUITY × firm size	H_{4b}			– 21	(1 64)	15	(1 54)
Diversity of contract term alignments × firm size	H_{4c}			–3 13**	(1 78)	–3 49**	(1 80)
Alignment of Contract Terms for the Knowledge-Appropriating Relationship Portfolio							
Proportion of LINK/NONEQUITY		– 95	(98)	– 44	(1 03)	– 33	(93)
Diversity of contract term alignments		– 86	(1 34)	– 56	(1 40)	–1 13	(1 31)
Proportion of LINK/NONEQUITY × firm size				– 30	(42)	– 28	(39)
		Log-Likelihood				**Wald χ^2**	
		–72 21		–70 27		35 07	
Observations		412		412		404[a]	

*$p < 10$
**$p < 05$
***$p < 01$
[a]Firms with fewer than two observations were omitted from estimation to account for AR(1) errors

Finally, the results in Models 2 and 5 show that the size of the relationship portfolio has no significant effect on the number of radical new products ($\beta = 00$, n s) or on the number of incremental new products ($\beta = 00$, n s) The ratio of knowledge-creating relationships to knowledge-appropriating relationships has no significant effect on the number of radical new products ($\beta = -02$, n s), whereas it has a marginally positive effect on the number of incremental new products ($\beta = 01, p < 10$)

Discussion

Previous marketing studies have recognized two different types of collaborative interfirm relationships in developing new products (1) collaborations for knowledge creation, such as "basic research that lays the foundations for additional R&D" or "long-term explorations in science and/or technology to build or maintain basic capabilities," and (2) collaborations for knowledge appropriation, such as "applied projects aimed at specific tasks" or "routine engineering" (Jap 2001, p 98) Although the importance of contract terms for effective collaboration has been emphasized (Ghosh and John 1999, 2005), the appropriate contract terms for these different types of collaborative relationships have not yet been articulated This study is among the first to examine how the alignment of contract terms in a firm's knowledge-creating and knowledge-appropriating relationship portfolios will affect the number of new products the firm introduces The major findings of this study and their implications are discussed in the next section

Theoretical Implications

The analysis of relationships initiated by pharmaceutical firms reveals that contract term alignments can significantly affect the efficiency and effectiveness of a firm's relationship portfolio Specifically, the results of this study indicate

TABLE 4
Effect of the Alignment of Contract Terms on the Number of Incremental New Products

Variables	Hypothesis	Model 4 (Random-Effects Model)	Model 5 (Random-Effects Model)	Model 6 (Population-Averaged Model)
Control Variables				
Constant		–3 95*** (81)	–4 16*** (81)	–3 91*** (84)
2003		– 36* (25)	– 37* (25)	– 36* (24)
2004		– 36* (25)	– 36* (25)	– 35* (25)
2005		– 55** (26)	– 53** (26)	– 51** (27)
2006		– 13 (25)	– 09 (25)	– 05 (25)
2007		– 58** (27)	– 49** (27)	– 47** (27)
Firm size		45*** (08)	46*** (08)	43*** (08)
R&D intensity		– 07 (72)	– 24 (68)	– 40 (70)
U S firms		– 29 (23)	– 44** (20)	– 46** (21)
Radical new product experience		– 08 (08)	– 07 (07)	– 06 (08)
Incremental new product experience		04* (03)	05** (02)	05** (03)
Relationship portfolio size		00 (00)	00 (00)	00 (00)
Ratio of knowledge-creating to knowledge-appropriating relationships		00* (00)	01* (00)	01* (00)
Alignment of Contract Terms for the Knowledge-Creating Relationship Portfolio				
Proportion of SCALE/NONEQUITY		– 77** (42)	– 32 (43)	– 44 (44)
Proportion of LINK/EQUITY		– 41 (50)	01 (49)	– 01 (50)
Diversity of contract term alignments		– 71* (50)	– 95** (53)	– 93** (54)
Proportion of SCALE/NONEQUITY × firm size			– 34** (17)	– 37** (17)
Proportion of LINK/EQUITY × firm size			– 32* (23)	– 32* (23)
Diversity of contract term alignments × firm size			11 (21)	22 (22)
Alignment of Contract Terms for the Knowledge-Appropriating Relationship Portfolio				
Proportion of LINK/NONEQUITY	H_3	67** (37)	93*** (39)	93** (40)
Diversity of contract term alignments		92* (58)	90* (57)	98** (59)
Proportion of LINK/NONEQUITY × firm size	H_5		– 29** (15)	– 33** (16)
		Log-Likelihood		**Wald χ^2**
		–289 28	–283 70	220 7
Observations		412	412	404[a]

*p< 10
**p< 05
***p< 01
[a]Firms with fewer than two observations were omitted from estimation to account for AR(1) errors

that a firm's knowledge-creating relationship portfolio leads to a greater number of radical new products when the firm uses SCALE/NONEQUITY for more relationships or when it uses more diverse alignments of contract terms In contrast, a firm's knowledge-appropriating relationship portfolio leads to a greater number of incremental new products when the firm uses LINK/NONEQUITY for more relationships The results of this study also indicate that the diversity of contract term alignments in a firm's knowledge-creating relationship portfolio has a negative effect on the number of incremental new products, whereas it has a positive effect on the number of radical new products A possible explanation is that, even though a firm's knowledge-creating relationship portfolio has the potential to result in more fundamental breakthroughs that offer significant advances in technologies and customer benefits, a new product that results from the knowledge-creating relationship portfolio might fail to meet the criteria for becoming a radical new product Namely, the knowledge-creating relationship portfolio might lead to only incremental new products when poorly managed in terms of the forms of resource integration and equity sharing Furthermore, this study shows that the effect of contract term alignments on the number of new products is contingent on the size (i e , the amount of internal resources) of the focal firm New product development by large firms, compared with small firms, is less affected by contract term alignments

These findings have important implications for the literature on relationship marketing and new product development First, this study extends our understanding of collaborative relationships for new product development by (1) distinguishing between knowledge creation and knowledge appropriation as two fundamental tasks in developing new products and (2) focusing on the relationship portfolio rather than on individual relationships In particular, the results of this study demonstrate that a difference exists between the knowledge-creating and knowledge-appropriating relationship portfolios in terms of the appropriate contract term alignments The knowledge-creating relationship portfolio benefits from contract term alignments that provide a compromise between the need for effective transfer of complex knowledge and the need for search flexibility in response to the uncertainty surrounding the creation of new knowledge In contrast, the knowledge-appropriating relationship portfolio benefits from contract term alignments that reduce the costs associated with setting up and enforcing the contract terms themselves

Second, even though one of the primary interests of interfirm relationship studies is to identify the contract terms relevant to the specific tasks at hand (Ghosh and John 1999, 2005, Heide 1994, Jap 2001), this study also reveals that firm size becomes a boundary condition for the effectiveness of contract term alignments in managing the interfirm relationship portfolio Contract terms provide a formal mechanism by which to specify the role of each partner in the collaboration and to ensure that partners perform the roles specified in the relationship agreement (Hoetker and Mellewigt 2009) These contract terms become more critical for smaller firms, which are more likely to lack the internal resources or capability to manage such collaborative relationships (Kalaignanam, Shankar, and Varadarajan 2007, Park, Chen, and Gallagher 2002) The results suggest that the amount of internal resources becomes a buffer that reduces concerns associated with forming new relationships and, consequently, reduces the need for specific contract terms

Third, because radical new products have a significant effect on a firm's profit and shareholder value (Sorescu, Chandy, and Prabhu 2003, Sorescu and Spanjol 2008, Wuyts, Dutta, and Stremersch 2004), factors that drive or hinder radical new product development are a primary focus in the innovation literature Although previous studies have examined various firm-level characteristics, such as firm size, incumbency, or willingness to cannibalize (Chandy and Tellis 1998, 2000), the current study extends knowledge in this direction by testing how characteristics of the relationship portfolio affect the numbers of radical and incremental new products that a firm introduces The results of this study suggest that contract term alignments can change not only the number of new products but also the types of new products (i e , radical vs incremental) developed, which highlights the importance of considering the appropriate alignment of contract terms for managing the relationship portfolio

Managerial Implications

Forming relationship portfolios by partnering with innovative firms is increasingly common in new product development (Wuyts, Dutta, and Stremersch 2004) Interfirm relationships provide access to external knowledge (Powell, Koput, and Smith-Doerr 1996) However, the results of this study show that simply entering into relationships is not sufficient to gain access to external knowledge and develop new products successfully This study, therefore, has several important managerial implications

First, the results provide important insights into the management of the relationship portfolio compared with the management of individual relationships In particular, the appropriate contract term alignments for the relationship portfolio might differ from those for individual relationships For example, previous studies have emphasized close interactions (e g , scale resource integration) and incentive alignments (e g , equity sharing) among partners for the outcomes of individual relationships (Dyer and Singh 1998, Jap 2001, Jap and Ganesan 1999) However, the results of this study suggest that using such contract terms (e g , SCALE/EQUITY) for more relationships in a firm's relationship portfolio can actually hurt the overall new product development outcomes of the firm Indeed, an additional analysis with SCALE/EQUITY and LINK/NONEQUITY, rather than SCALE/NONEQUITY and LINK/EQUITY, in Model 1 (Table 3) shows that using SCALE/EQUITY for more relationships in a firm's knowledge-creating relationship portfolio has a negative effect on the number of radical new products developed by the firm ($\beta = -4\ 06, p < \ 05$) That is, determinants of the outcomes of the relationship portfolio can be at variance with those of individual relationships in that firms must consider their overall level of search flexibility and the effectiveness of their collaboration with current partners (Bidault and Cummings 1994, Uzzi 1997)

Second, this study provides specific guidelines for differentiating among the relevant contract terms for the knowledge-creating and knowledge-appropriating relationship portfolios For the knowledge-creating relationship portfolio, the results of this study suggest two types of strategies for contract term alignments A firm can achieve a greater number of radical new products by using SCALE/NONEQUITY for more relationships or by diversifying the alignment of contract terms, both of which enable the firm to access its partners' technological knowledge while maintaining some degree of search flexibility For the knowledge-appropriating relationship portfolio, the results of this study suggest that a firm can benefit from using LINK/NONEQUITY for more relationships, which would reduce the costs associated with setting up and enforcing the contract terms themselves

Finally, the results of this study suggest that, compared with larger firms, smaller firms should be more cautious in determining specific contract terms when forming relationships, because they must rely more on the formal contract terms and they suffer more from having inappropriate contract terms That is, compared with larger firms, smaller firms must craft specific contract terms more carefully and in a manner that reduces their concerns when forming relationship agreements (Alvarez and Barney 2001)

Limitations and Further Research

As with any study, this study has several limitations, which provide a set of promising future research opportunities First, I used the pharmaceutical industry to test the proposed hypotheses empirically Although this industrial context has frequently been used to examine interfirm relationship portfolios (Stremersch and Dyck 2009, Wuyts, Dutta, and Stremersch 2004), further research across a diversity of industries would provide more insights into contract term alignments for the collaborative relationship portfolio For example, interfirm collaboration in the high-tech industries might entail different concerns from those in the low-tech industries (Mizik and Jacobson 2003, Rowley, Behrens, and Krackhardt 2000) The dynamically changing environments in the high-tech industries might require more flexibility in searching for alternative partners and forming and dissolving collaborative relationships, whereas the more stable environments in the low-tech industries might benefit from longer-term relationships. Therefore, further research in diverse industrial contexts will enrich our understanding of the appropriate contract terms for pursuing new product innovations through the collaborative interfirm relationship portfolio.

Second, even though I examined firm size as a moderator of the relationship between the alignment of contract terms and new product outcomes, further research efforts are needed to explore other potential moderating factors. For example, firms develop the capability to manage collaborative relationships by accumulating relationship experience, both general and partner specific (Anand and Khanna 2000; Kale, Dyer, and Singh 2002). This relationship experience might reduce the need for formal contract terms when managing the collaborative relationship portfolio. Further research that examines various moderating factors will extend our knowledge of when firms would benefit from which contract terms.

Finally, the focus of this study was to test how a firm's alignment of contract terms for its relationship portfolio would affect the number of new products. A promising extension of this study would be to use a behavioral approach that examines the choice of contract terms across the knowledge-creating and knowledge-appropriating relationship portfolios. That is, it would be beneficial to examine how the choice of contract terms for knowledge-creating relationships is correlated with the choice of contract terms for knowledge-appropriating relationships.

Appendix
Detailed Specifications for and Results of the Robustness Tests

Length of the Time Window

In this study, I used a 12-year window to measure the relationship portfolio by considering the characteristics of the pharmaceutical industry (DiMasi, Hansen, and Grabowski 2003). I tested the robustness of the results by replicating them with two alternative time windows, specifically, a 10-year and a 14-year window. Overall, I found consistent results across the different time windows. However, when the 10-year window was used, the parameters for contract term alignment in the knowledge-creating relationship portfolio became less significant. In contrast, no significant change was found when the 14-year window was applied, which indicates little added value when using a time window longer than 12 years. These findings empirically support the choice of a 12-year window.

Furthermore, it might take a shorter time to obtain new product development outcomes from the knowledge-appropriating relationship portfolio than from the knowledge-creating relationship portfolio. I tested the robustness of this time lag by applying asymmetric time windows, specifically, a 6-year window for the knowledge-appropriating relationship portfolio and a 12-year window for the knowledge-creating relationship portfolio. The results were consistent with the main findings of this study with one minor exception. The moderating effect of firm size on the effect of the proportion of knowledge-creating relationships using SCALE/NONEQUITY on the number of radical new products became more significant (from $p < .10$ to $p < .05$). Overall, these tests with various time windows confirm the robustness of the empirical findings of this study.

The Depreciation and Appreciation of Relationship Value over Time

This study did not take into account the depreciation or appreciation of the value of relationships over time. However, relationships initiated at different times within the 12-year window may vary in their relevance or importance to new product development. In particular, two factors should be considered. On the one hand, previous studies have examined knowledge depreciation over time that results from technological or market changes (Griliches 1979; Henderson and Cockburn 1996; Wuyts, Dutta, and Stremersch 2004). From this point of view, greater weight should be given to more recent relationships because knowledge gained in the past loses its relevance over time (Griliches 1979). On the other hand, knowledge appreciation over time must also be considered in the sense that it takes time for relationship activities to result in outcomes (Madhavan and Grover 1998; Wuyts, Dutta, and Stremersch 2004). Therefore, less weight should be given to more recently formed relationships. The relevance of relationships over time will be determined by the net effect of these two factors. Therefore, I test the robustness of the results in three ways: (1) by giving less weight to relationships initiated further in the past (knowledge depreciation), (2) by giving less weight to relationships initiated more recently (knowledge appreciation), and (3) by giving less weight in both directions from the central point in the 12-year window (both knowledge depreciation and knowledge appreciation). Consistent with previous studies (Griliches 1979), I applied a 20% discount per year for knowledge depreciation and appreciation over time.

All three cases show consistent results with the same conclusion, which confirms the robustness of this study. However, when less weight is imposed in both directions—that is, taking into account both knowledge depreciation and knowledge appreciation (the third case)—the results became more significant. In particular, the moderating effect of firm size on the effect of the proportion of knowledge-creating relationships using SCALE/NONEQUITY on the number of radical new products becomes more significant (from $p < .10$ to $p < .05$). In contrast, when knowledge depreciation or appreciation is considered, the results become marginally less significant. For example, with knowledge depreciation, the significance level declined from $p < .05$ to $p < .10$ for the effect on the number of radical new products of the proportion of knowledge-creating relationships using SCALE/NONEQUITY. Similarly, the significance level declined from $p < .05$ to $p < .10$ for the moderating effect of firm size on the effect of the diversity of contract term alignments in the knowledge-creating relationship portfolio on the number of radical new products. With knowledge appreciation, the significance level declined from $p < 01$ to $p < 05$ for the effect on the number of incremental new products of the proportion of knowledge-appropriating relationships using LINK/NONEQUITY These results indicate that considering both depreciation and appreciation marginally improves the results

Test of a Reverse Causal Relationship

To show the validity of the findings of this study, it is necessary to exclude the possibility of a reverse causal relationship, whereby the choice of contract terms is driven by the types of intended new products Because the types of products a firm intends to develop are not directly measurable in the current data set, I test this with two sets of indicators of products that the firm intends to develop from its relationship portfolio (1) the numbers of radical and incremental new products that the firm introduced in year t, under the assumption that firms will achieve their intended new products by choosing the appropriate contract terms, which implies that the realized outcomes reflect the intended outcomes, and (2) the radical and incremental new product experiences, specifically, the numbers of radical and incremental new products that the firm introduced during the 3-year period before the 12-year window, from t – 15 to t – 13, under the assumption that firms will continue to pursue the same types of new products (Gatignon and Xuereb 1997, Slater, Olson, and Hult 2006) This assumption implies that past outcomes can be an indicator of the intended outcomes of additional new product development efforts

The dependent variables are the four contract term alignments for which I developed hypotheses (1) the proportion of SCALE/NONEQUITY, (2) the proportion of LINK/EQUITY, (3) the diversity of contract term alignments in the knowledge-creating relationship portfolio, and (4) the proportion of LINK/NONEQUITY in the knowledge-appropriating relationship portfolio From the Hausman (1978) test, I found a significant difference between results of the fixed- and random-effects models for the proportion of SCALE/NONEQUITY in the knowledge-creating relationship portfolio ($p < 01$) and for the proportion of LINK/NONEQUITY in the knowledge-appropriating relationship portfolio ($p < 01$), therefore, I used a fixed-effects linear model for these contract term alignments However, I found no significant difference between the fixed- and random-effects models for the proportion of LINK/EQUITY and the diversity of contract term alignments in the knowledge-creating relationship portfolio ($p = 98$ and 90, respectively) Accordingly, I used a random-effects linear model for these two alignments I also checked for serial correlations of errors, following the recommendation of Wooldridge (2002) for linear panel models, and the hypothesis of no first-order serial correlation was rejected for all four types of alignments ($p < 01$) To control for first-order serial correlations of errors, I therefore use the "xtregar" procedure in Stata 11

Table A1 shows that none of the four indicators of intended product outcomes had a significant effect on any of the contract term alignments The one exception was that radical new product development experience had a significant positive effect on the proportion of LINK/NONEQUITY in the knowledge-appropriating relationship portfolio ($\beta = 023$, $p < 05$), which indicates that a reverse causal relationship does not exist between the intention to develop incremental new products and the use of LINK/ NONEQUITY These results support the validity of the findings of this study

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TABLE A1
Effect of Radical and Incremental New Products on the Alignment of Contract Terms

	Knowledge-Creating Relationship Portfolio (t – 1 ~ t – 12)			Knowledge-Appropriating Relationship Portfolio (t – 1 ~ t – 12)
Variables	Proportion of SCALE/ NONEQUITY (Fixed-Effects Model)	Proportion of LINK/EQUITY (Random-Effects Model)	Diversity of Contract Term Alignments (Random-Effects Model)	Proportion of LINKNONEQUITY (Fixed-Effects Model)
Constant	–1 905*** (185)	395*** (112)	080 (101)	1 302*** (167)
2003	1 033*** (187)	– 044*** (012)	– 024* (013)	– 335** (169)
2004	1 628*** (292)	– 066*** (015)	– 028** (016)	– 531** (264)
2005	1 981*** (352)	– 082*** (016)	– 063*** (017)	– 643** (318)
2006	2 205*** (385)	– 105*** (017)	– 079*** (018)	– 701** (349)
2007	2 333*** (406)	– 110*** (017)	– 094*** (018)	– 723* (368)
Firm size	– 007 (019)	– 014* (010)	039*** (009)	– 015 (017)
R&D intensity	– 009 (025)	– 003 (018)	024 (019)	– 015 (022)
U S firms		– 118* (086)	067 (074)	
Relationship portfolio size	– 001 (002)	001* (001)	002*** (001)	– 005*** (001)
Ratio of knowledge-creating to knowledge-appropriating relationships	– 000 (003)	– 000 (001)	001*** (000)	005** (003)
Number of radical new products (t)	– 006 (017)	007 (015)	002 (017)	– 002 (015)
Number of incremental new products (t)	– 005 (006)	– 002 (005)	– 003 (005)	001 (006)
Radical new product experience (t – 15 ~ t – 13)	– 019 (015)	– 010 (011)	001 (012)	023** (013)
Incremental new product experience (t – 15 ~ t – 13)	– 002 (005)	– 002 (004)	– 003 (005)	002 (005)
R^2 (within)	173	180	103	106
R^2 (between)	008	115	285	001
Observations	334	412	412	334

*p < 10
**p < 05
***p < 01

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Introduction to the *Journal of Marketing* 75th Anniversary Special Section

This year marks the 75th anniversary of *Journal of Marketing* (*JM*) The journal has led the development of marketing thought and has come a long way over the years

To celebrate the 75th anniversary, this issue of *JM* includes a section consisting of articles of a special nature[1] An anniversary is a time for celebrating the past, it is also a time to reflect on the future of the discipline and what we can do to make it even brighter With this in mind, a key theme underlying the contributions in this special section is a focus on the future Most of the articles offer important insights into strengthening scholarship in the discipline A few focus on substantive areas that are ripe for generating new insights Each author writes on a topic about which he or she is extremely knowledgeable and feels passionately Many thanks are due to the authors of these articles for their contributions I provide a brief overview of each article and encourage you to read for yourself the insights each offers

Notably, this year also marks the 50th Anniversary of the Marketing Science Institute (MSI), an exemplary organization that is the envy of other disciplines Ruth Bolton discusses the highly symbiotic relationship between *JM* and MSI over the past several decades

Looking to the future, a major issue confronting us is sustainability Phil Kotler discusses this critical imperative and ways in which marketing must be responsive

The importance of conceptual contributions in academic research cannot be overstated Debbie MacInnis delineates a variety of conceptual contributions that scholars can make and discusses the skills and facilitating tools for making such contributions In addition to strong conceptualization, good research entails strong methods However, many in the field are conflicted about whether the field has become too "sophisticated" for its own good Lehmann, McAlister, and Staelin highlight the importance of the right type of sophistication in scholarship and discuss things we can do to encourage it

The growing importance and influence of emerging markets is visible to all Jag Sheth challenges us to rethink marketing in light of the experiences of developing markets Markets have become not only more complex but also more dynamic George Day describes the role of adaptive marketing capabilities for competing effectively in such markets

The generation, dissemination, and practitioner use of academic knowledge is a holy grail for many Gary Lilien explores what academicians, practitioners, and intermediaries can do to bridge the academic–practitioner divide, the topic of a recent symposium organized by Columbia Business School and Harvard Business School Bernie Jaworski provides deeper insights into the meaning of managerial relevance of research and discusses things that knowledge generators and users can do to derive mutual benefit Finally, Rich Lutz explores newer models for generating knowledge and disseminating it quickly and widely

I thank the American Marketing Association for supporting the special section with extra pages in this issue This ensured that the publication of the special section did not in any way impede the publication of a regular article

I hope you enjoy the articles in this section!

AJAY K KOHLI
Editor in Chief

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[1] The authors are accomplished members of our community, and each holds multiple distinctions, such as AMA Irwin/McGraw-Hill Distinguished Marketing Educator Award recipient, ISMS Fellow, Editor of *Journal of Marketing*, Editor of *Journal of Consumer Research*, Executive Director of the Marketing Science Institute, winner of "best-paper" awards from top marketing journals, Chair of the AMA Board of Directors, AMA Vice President of Publications, and President of the Association for Consumer Research The contributions were invited in consultation with a small group of marketing thought leaders, and each article underwent multiple rounds of review by top scholars The reviewers' help and that of my coeditors, Bob Leone and Gary Frazier, is gratefully acknowledged

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Ruth N. Bolton

To *JM* on Its 75th Anniversary

This article discusses how *Journal of Marketing* (*JM*) has influenced marketing science and practice by publishing articles on substantive topics relevant to customers, managers, organizations, markets, and society The journal's 75th anniversary coincides with the 50th anniversary of the Marketing Science Institute (MSI) Frequently, *JM* and MSI have collaborated to address important substantive marketing issues identified in MSI's Research Priorities The author highlights seminal articles on brand equity, business-to-business marketing (including sales force management), connecting marketing information, metrics, and strategy, consumer behavior, innovation, new product development and product management, marketing orientation and capabilities, and market research, methodology and services She also draws attention to articles that have won the Sheth Foundation/*JM* Award and the H Paul Root Award The article describes how *JM*'s knowledge dissemination is amplified by powerful social network effects Ideas in *JM* articles diffuse through the business community, influencing the mind-set of managers worldwide

Keywords role of marketing, brand equity, business-to-business, metrics, marketing information, consumer behavior, innovation, capabilities, marketing research, services

> What's past is prologue, what to come, in yours and my discharge
> —William Shakespeare, *The Tempest* (Act 2, Scene 1, Lines 245–254)

Happy anniversary to *Journal of Marketing* (*JM*)! There is much to celebrate While its format and content have changed dramatically over the past 75 years, *JM*'s promise to its readers—articles that rigorously address substantive issues in marketing and marketing management—has remained the same Moreover, with each issue, it delivers on that promise

At the Marketing Science Institute (MSI), we believe that *JM*'s focus on substantive issues in marketing has become increasingly important for two reasons First, since *JM*'s inception, changes in markets, customers, and technologies have enabled new business models, processes, and products, such as the infusion of services into goods-dominant firms, products coproduced or cocreated with customers or network partners, and offerings dynamically customized as customer behavior is observed over time These changes raise many compelling questions about substantive issues in marketing (MSI 2010) Second, as some marketing thought leaders have observed, there is an increasing gap between the interests, standards, and priorities of academics and those of practitioners who function in this complex business landscape (e g , Reibstein, Day, and Wind 2009) For these reasons, *JM* plays an important role in encouraging rigorous research on marketing issues that are relevant to organizations and society

The 75th anniversary of *JM* coincides with the 50th anniversary of MSI For many decades, their activities have been closely intertwined Thus, it is useful to briefly reflect on the shared history of MSI and *JM* and contemplate how their activities have shaped—and will continue to shape—the future of marketing

Knowledge generated and disseminated by MSI and *JM* has so infused modern business practice that many managers do not recognize its origin Our member company trustees are often surprised to discover that current "best practices" in marketing were pioneered by research supported by MSI and published in *JM* Consider a few examples from across the decades

- •Brand equity (Aaker and Keller 1990, Ailawadi, Lehmann, and Neslin 2003, Keller 1993, Kirmani, Sood and Bridges 1999),
- •Business-to-business marketing, including sales force management (Churchill et al 1985, Johnston and Bonoma 1981, Palmatier 2008, Palmatier, Dant, and Grewal 2007, Palmatier et al 2006, Walker, Churchill, and Ford 1975),
- •Connecting marketing information, metrics, and strategy (Mizik and Jacobson 2003, Moorman and Zaltman 1993, Rust, Lemon, and Zeithaml 2004, Srivastava, Shervani, and Fahey 1998, Verhoef and Leeflang 2009),
- •Consumer behavior (Fournier and Mick 1999, Loken and John 1993, Wansink and Ray 1996),
- •Innovation, new product development and product management (Biyalogorsky, Boulding, and Staelin 2006, Chandy, Prabhu, and Antia 2003, Chandy and Tellis 2000, Day, Shocker, and Srivastava 1979, Sood and Tellis 2005, Sorescu, Chandy, and Prabu 2003, Srivastava et al 1984, Srivastava et al 1981),
- •Marketing orientation and capabilities (Day 1994, Jaworski and Kohli 1993, Kohli and Jaworksi 1990, Narver and Slater 1990, Slater and Narver 1993),
- •Marketing research (Green 1975, Green and Rao 1970), and
- •Services (Lovelock 1983, Parasuraman, Zeithaml, and Berry 1985, Solomon et al 1985, Zeithaml 1988)

A major reason for *JM*'s success in advancing the science and practice of marketing is that its articles are amplified by powerful social network effects The ideas in *JM*'s articles have been broadly diffused through academic con-

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ferences, the popular business press, practitioner conferences, workshops and seminars, university courses and executive education, and the activities of marketing services suppliers and consulting firms. In this way, they have reached a broad community of people who are interested in marketing and business issues.

At MSI, we are especially proud that five of the nine articles that have received the Sheth Foundation/*Journal of Marketing* Award were supported by MSI: Day (1994), Jaworski and Kohli (1993), Keller (1993), Rust, Lemon, and Zeithaml (2004), and Srivastava, Shervani, and Fahey (1998). The Sheth Foundation/*Journal of Marketing* Award is given six to ten years after a *JM* article was originally published; it is awarded to the best *JM* article that has made long-term contributions to the field of marketing. These time-tested, award-winning articles have thousands of citations in the academic literature because they provide a rigorous theoretical foundation for marketers who are thinking about substantive marketing issues (Yadav 2010). Equally important, as the ideas in these articles have diffused throughout the business community, they have profoundly influenced the mind-set of managers worldwide.

Journal of Marketing and MSI have also collaborated to promote interactions among marketing academics and practitioners that generate and disseminate new knowledge on specific MSI Research Priorities. In 2004, MSI sponsored a paper competition and special section of *JM* on "Linking Marketing to Financial Performance and Firm Value." It comprised seven articles, plus an editorial by Donald R. Lehmann, who served as consulting editor. In 2009, MSI sponsored a *JM* special section on "Marketing Strategy Meets Wall Street," coedited by Dominique M. Hanssens, Roland T. Rust, and Rajendra K. Srivastava; it included nine articles, plus an editorial. In 1999, MSI also provided the funds to publish a special *JM* issue on "Fundamental Issues and Directions for Marketing"; coedited by George S. Day and David B. Montgomery, this issue celebrated the new millennium (Lusch 1999).

Another way that *JM* and MSI advance the practice of marketing is the annual H. Paul Root Award, named in honor of the president of MSI from 1990 to 1998 and cosponsored by the American Marketing Association and MSI. The topics of articles that have recently won this award show how rigorous research can address important substantive marketing issues facing managers:

- "Expanding the Role of Marketing: From Customer Equity to Market Capitalization" (Kumar and Shah 2009)
- "Drivers of Success for Market Entry into India and China" (Johnson and Tellis 2008)
- "A Longitudinal Examination of Net Promoter and Firm Revenue Growth" (Keiningham et al. 2007)
- "Creating a Market Orientation: A Longitudinal, Multifirm, Grounded Analysis of Cultural Transformation" (Gebhardt, Carpenter, and Sherry 2006)
- "Balancing Acquisition and Retention Resources to Maximize Customer Profitability" (Reinartz, Thomas, and Kumar 2005)

What's next for *JM*? Marketing offers a rich domain to explore, and there is so much more to discover. At MSI, we believe that *JM*'s focus on substantive marketing issues is as necessary today as it was 75 years ago. In the theatrical metaphor that opens this article, Shakespeare reminds us that "what's past is prologue"; that is, the past is the foundation for acts that will shape the future. *Journal of Marketing* has an exceptional track record of articles that rigorously address substantive issues in marketing and marketing management. However, as Shakespeare goes on to say, "what to come, in yours and my discharge." In other words, the future is in our hands. It is *your* responsibility—as readers, authors, reviewers, editors, researchers, teachers, managers and citizens—to shape the future of marketing.

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Philip Kotler

Reinventing Marketing to Manage the Environmental Imperative

Marketers in the past have based their strategies on the assumption of infinite resources and zero environmental impact With the growing recognition of finite resources and high environmental costs, marketers need to reexamine their theory and practices They need to revise their policies on product development, pricing, distribution, and branding The recent financial meltdown has added another layer of concern as consumers adjust their lifestyles to a lower level of income and spending Companies must balance more carefully their growth goals with the need to pursue sustainability Increased attention will be paid to employing demarketing and social marketing thinking to meet the new challenges

Keywords environment, sustainability, externality costs, financial meltdown, consumer lifestyles, demarketing, social marketing

On this occasion to celebrate the 75th anniversary of *Journal of Marketing*, it is important to recognize its many contributions to the theory and practice of marketing *Journal of Marketing* has carried articles advancing new marketing concepts, theories, practices, and empirical findings, and it has had to overcome old views of marketing As late as 1997, *Random House Webster's Dictionary of American English* defined marketing as "act or practice of advertising and selling a product " Fortunately, we have broadened our view of marketing, as captured in the latest American Marketing Association (2008) definition "Marketing is the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for consumers, clients, partners, and society at large" (see http //www marketingpower com) Furthermore, over the years, marketing has broadened its compass beyond products to include other offerings, such as services, experiences, places, persons, ideas, and causes

Looking ahead, we see the emergence of a whole new marketing environment that will affect the science and practice of marketing in the coming years Marketers have had to recognize such forces as globalization, cultural differences, the Internet, social media, brand proliferation, retail concentration, recession, and environmental issues

The Environmental Imperative and What Companies Are Doing Today

Of these forces, I would like to comment on the profound influence that the environmental agenda is likely to have on marketing theory and practice Companies must address the issue of sustainability Sustainability raises the question whether this generation can leave future generations with the same or a larger basket of resources than we have now (see World Commission on Environment and Development 1987) It would be easy for this generation to use up more of our resource endowments and leave future generations with less, and this would be unconscionable

According to Professor Walter Georgio Scott (2005), we face not one but several environmental challenges

- A change (probably irreversible) in the composition of the atmosphere and consequently of the climate,
- A depletion of the ozone layer, the shield protecting the Earth from ultraviolet radiation,
- Soil degradation and increased desertification,
- Increased air and water pollution,
- A reduction in the availability of fresh water, and
- Increasing depletion of physical and natural resources, from oil to copper, to timber, and so forth

Companies need to make drastic changes in their research-and-development, production, financial, and marketing practices if sustainability is to be achieved

With regard to marketing, companies and their marketers have operated on the assumption of an endless supply of resources and, furthermore, that production, distribution, and consumption do not add to pollution, water shortage, and other costs, or at least that companies do not have to bear these costs Once we begin to acknowledge resource limitations and externality costs, marketing will have to reinvent its practices to be environmentally responsible

We need to recognize a major difference in the mindsets of firms and consumers in the presustainability versus the sustainability world Consider the largely unexamined assumptions of marketers in the past

- Wants are natural and infinite, and encouraging unlimited consumption is good
- The planet's resources are infinite
- The earth's carrying capacity for waste and pollution is infinite
- Quality of life and personal happiness increase with increased consumption and want satisfaction

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In contrast, those who press for sustainable practices hold the following principles:

- Wants are culturally influenced and strongly shaped by marketing and other forces.
- The earth's resources are finite and fragile.
- The earth's carrying capacity for waste and pollution is very limited.
- Quality of life and personal happiness do not always increase with more consumption and want satisfaction.

Companies that embrace sustainability need to make some basic changes in their production and marketing practices. Paul Polman, chief executive officer (CEO) of Unilever, is one of several strong advocates of sustainability in business (Stern 2010). "Our ambitions are to double our business, but to do that while reducing our environmental impact and footprint. . . . But the road to well-being doesn't go via reduced consumption. It has to be done via more responsible consumption."

This poses a difficult challenge, however. If every company such as Unilever was to succeed in doubling its business, sustainability will be impossible to achieve. We have heard many times that if less developed countries would by some miracle achieve the living standards of more advanced countries, pollution, road and air traffic, and energy power outages would smother our quality of life. Something between a zero-growth goal and a modest-growth goal would make more sense.

Sustainability-driven companies need to explain how they would revise their goals and operations to pursue sustainability. They need to introduce new and broader criteria to direct their new product development programs, invest more in reuse and recycling, and convince all their stakeholders—employees, channels, suppliers, and investors—to accept many difficult changes.

Can we expect the C-level executives and company investors to accept a more moderate rate of growth? Companies would have to change the compensation package to encourage their decision makers to set a better balance between the goals of growth and sustainability. It would make sense for the CEO to earn a payout based on achieving the planned growth rate while having reduced environmental costs by a planned percentage.

Some companies have adopted the environmental credo with zest, and we need to find out more about their policies for balancing profitable growth and sustainability. General Electric, under the leadership of Jeff Immelt, has launched the Ecoimagination program, looking for ways to make profit out of solving social problems. DuPont has done a great job of finding ways to reduce pollution and produce materials that are sustainability appropriate. Wal-Mart has built its truck fleet to be more fuel efficient and is also goading its suppliers to change their truck fleets to be more fuel efficient and less polluting. By 2012, Wal-Mart will require more than 60,000 of its suppliers to source 95% of their production from highly ranked "environmentally oriented" companies. The march toward marrying good business practice with sustainability is going forward in a number of notable companies.

What marketing practices will have to change? Consider the four Ps:

- *Product:* Companies will have to consider more questions in the course of developing new products. Designers will have to consider the materials more carefully and their sources and carbon footprints. They will have to develop the packaging more carefully in terms of being biodegradable and disposable. Service firms that do not produce a physical product (e.g., professional firms, hospitals, colleges, airlines) have a chance to compete better by demonstrating their environmental concerns in their use of energy and physical supplies and to contribute to conservation causes.
- *Price:* Companies can create a menu of offerings that differ in their level of environmental friendliness and price them accordingly. Environmentally involved customers may be willing to pay more. Companies will also need to consider how their pricing will be affected by possible new regulations requiring them to cover more of the externality costs they create.
- *Place:* Companies will need to consider where to locate their production and distribution facilities. Environmentalists advocate more locally based production, which would call for more decentralized production. Marketers pursuing sustainability may want to rate the different potential distribution channels for their commitment to sustainable practices. Companies can make greater use of online selling of their products to reduce the amount of consumer driving to outlets.
- *Promotion:* Companies will need to consider how much to shift their promotion from print to online, based on the notion that print uses up paper, ink, and other resources. They will want to communicate their commitment to sustainability (i.e., being a good citizen) in more of their advertisements. Their product labeling might need to be more specific about the ingredients and their carbon footprints. Virtually all companies seek growth, but they need to put more emphasis on sustainable paths to growth.

The Consumer Pressure: Why Companies Will Need to Change Their Marketing Practices

Major pressure for changing marketing practices may come from consumers themselves. Consumers are the ultimate power brokers. Marketers have viewed consumers as choosing among brands on the basis of functional (Marketing 1.0) and emotional (Marketing 2.0) criteria. But many of today's consumers are adding a third dimension—namely, how the company meets its social responsibilities (Marketing 3.0). Consumers today carry new concerns, doubts, and fears. Will they keep their jobs? Can they save enough for retirement? Will the road traffic get much worse? Will the air get more polluted? Will products be made in ways that are environmentally clean?

My conclusion is that increasing numbers of people will prefer to buy from companies that care. Companies will need to add an environmental dimension to their profile. They do not want to appear indifferent to larger economic, social, and political concerns. Word of mouth is becoming a growing force in shaping consumer decisions. Consumers can be e-mailing, blogging, and tweeting to their friends and acquaintances good things or bad things about a company. Companies are increasingly swimming in a highly transparent fishbowl.

Will consumers be willing to buy offerings that are more environmentally friendly? Yes, if the price is the same. But there is also evidence that some consumers will be willing to pay more. Jared Diamond (2004) describes Home Depot stores that set up two bins of plywood next to each other. One bin contained plywood carrying the Forest Stewardship Council (FSC) label guaranteeing that the tree was taken from a forest managed in accordance with FSC guidelines. When the price of the wood was the same in both bins, nearly all the customers chose the plywood with the FSC label. When the FSC labeled plywood was priced 2% higher, still 37% of the customers chose the FSC-labeled plywood.

There are also electricity companies that charge a little more per kilowatt-hour than their competitors because their energy is sourced more from solar and wind. More research is needed on how many people will pay more and how much more they will pay for more environmentally sound offerings.

An effect of the recent financial meltdown has been to drive people to think more reflectively about their lives as consumers. At one time, we called them "citizens", now we call them "consumers." But these citizens are asking new questions:

- Are we eating too much food? Is it the wrong kind of food? Can we give up beef, which is such an inefficient way to meet our protein needs? Are we consuming too much sugar and salt and butter? Are family members following a healthy diet?
- Are we driving a fuel-efficient car? Do we even need to own a car?
- Can we save more energy in the running of our home by more efficient lighting, solar panels, and other steps?
- Can we sort trash more efficiently into paper, cans and bottles, and waste?

Periodically, there are reports of households that have chosen to move to a "less is more" lifestyle, sometimes as a result of income loss and other times as a family environmental commitment. Living a more balanced lifestyle, one not overcharacterized by materialism, does not necessarily mean living a less happy life. To quote William Wordsworth, "The world is too much with us, getting and spending, we lay waste our power."

John Gerzema (2010) of Young & Rubicam reports the following recent findings:

> In light of the "Great Recession," there are new data to suggest Americans are less apt to equate materialism with overall happiness. In a study on post-crisis consumerism using data from BrandAsset® Valuator, 77% of people agreed that "Since the recession, I realize that how many possessions I have does not have much to do with how happy I am." And both the Millenials (those with the least assets) and the Baby Boomers (those with the most assets) both believed this the most strongly. The study also showed that 62% of Americans agree that "Since the recession, I realize I am happier with a simpler, more down to basics lifestyle" [and] 77% of people agreed that "How I spend my time is more important than how much money I make." The research suggests that "mindless consumption" is becoming more "mindful" and that brands and marketing can play a greater role in connecting with the values shifts of the post-crisis consumer. 72% of people agreed that "I make it a point now to buy brands from companies whose values are similar to my own." And two-thirds of all people agreed that "I make it a point to avoid buying brands whose values contradict my own."

Some consumers have recently been labeled "LOHAS," an acronym standing for "lifestyles of health and sustainability" (Environmental Leader 2009). One estimate placed 19% of the adults in the United States, or 41 million people, in the LOHAS or "cultural creatives" category. The market for LOHAS products is growing and encompasses organic foods, energy-efficient appliances and solar panels, alternative medicine, yoga tapes, and ecotourism. Taken together, these account for an estimated $209 billion market.

If a sufficient number of families begin adopting a more LOHAS-oriented lifestyle, this will directly affect the marketing consciousness and practices of producers. The media will be more alert to report stories of energy and material waste, harmful ingredients, and damage to the planet's sustainability. Producers will have to decide more carefully what to produce, how to produce it, how to distribute it, and how to promote it. They will not want to be exposed by watchdog consumers and employee whistleblowers who spotlight bad practices. With the continued growth of social media, no company can safely avoid negative word of mouth when it crosses into irresponsible production and marketing.

We have emphasized how sustainability concerns might affect the consumer market. Will sustainability have as much of an impact on business-to-business (B2B) product and service companies? Most B2B companies will take "green" steps when they promise to yield strong economic savings. If they can save on energy or replace one ingredient or component with an environmentally better one *and* save money, they will make the change. But B2B companies are further removed from consumer pressure. However, they may receive pressure from their distributors and customers to adopt more environmentally friendly practices even if immediate savings are not evident.

There will also be influence from environmental organizations, social media, and concerned citizens about sustainability and from a greater recognition that happiness is not all about practicing greater consumption. Governments at the federal, state, and local levels may also play a stronger role if consumers and voters push them to use legislation, regulation taxation, and incentives to support sustainability and the health and safety of citizens. Government could go further by pushing for companies to bear more of the costs of negative externalities, although this would create a political hailstorm as big or bigger than the health care debate.

The Rise of Demarketing and Social Marketing

From a marketing point of view, there is likely to be a ramping up of two marketing perspectives that will affect the quality of our future environment. The first is "demarketing," defined as the practice of demand reduction (Kotler and Levy 1971). Demarketing uses the same four Ps (product, price, place, and promotion) of marketing but in a reverse way. A vivid example is available from California communities that have faced a chronic water shortage. Local governments have had to adopt a demarketing strategy to reduce industries and consumers' water consumption. Today, there are more targets for demand reduction than there have been in the past. We need to combat overfishing, energy waste, overeating, and obesity, among other issues. Governments, as well as some industries, will need to develop more effective tools and skills in demand reduction. Marketing has traditionally been about demand expansion, and this will remain the dominant pursuit, however, there are times and resources that will demand conservation and reduction. Electricity companies today are trying to educate people to turn off their lights and even unplug their computers when not in use to save electricity, even though their revenue will fall.

The second perspective is "social marketing," defined as the theory and practice of marketing an idea, cause, or behavior (Kotler and Zaltman 1971). Social marketing has an almost 40-year history and many successes in influencing more positive awareness and behavior through campaigns such as "stop smoking," "say no to drugs," "exercise more," and "eat healthier foods" (Kotler 2008). It is not to be confused with one P, promotion; it requires the full use of segmentation, targeting, and positioning and the four P's (product, price, place, and promotion) to influence positive behavior.

There are thousands of professionals working around the world in governmental agencies (e.g., the Environmental Protection Agency) and nongovernmental organizations (e.g., Nature Conservancy, the Sierra Club) responsible for influencing behaviors that protect the environment. They work in government agencies, utility companies, energy departments, fish and wildlife industries, and natural resources. Nancy Lee, Doug McKenzie-Mohr, Wesley Schultz, and I are in the process of collecting cases of successful applications of social marketing to reduce waste, protect water quality, reduce water usage, reduce emissions, reduce energy use, and protect forests and fisheries and wildlife for a book called *Social Marketing for the Environment*. One such example (Nancy Lee 2012) is the Natural Yard Care Neighborhoods program, which offers two-hour neighborhood workshops to help residents learn about and implement 24 environmentally responsible gardening behaviors, including smart watering and less use of pesticides. Free and conveniently located workshops were promoted, and over the next few years, an estimated 1200 people participated, with an average of 60 in each workshop. The application of a four Ps social marketing approach resulted in substantial numbers of participants using less water and pesticides and adopting other environmentally friendly gardening behaviors.

The Research Imperatives

The need for sustainable marketing practices means new challenges for marketing scholars and, in particular, for marketing practitioners. We need to carry out research on several important issues:

- What factors lead consumers to give more weight to sustainability? Which segments of consumers are likely to give more weight to sustainability?
- What factors lead companies to compete on the basis of sustainability? What changes in marketing practice does sustainability seem to require?
- What arguments can a company make to its investors to get their agreement to accept sustainability as yielding a positive return on investment?
- Are companies in danger of losing some dynamism as a result of environmental regulations and taxes? Have "green" companies had more or less growth than their "nongreen" competitors? What factors have operated?
- What opportunities has sustainability opened up? What kinds of companies have been most successful in exploiting these opportunities? What factors have contributed to their success?
- What government legislation, regulation, taxes, and incentives are likely to be enacted? Which are likely to have a major impact on product development, pricing, distribution, and promotion?

No one has the answers, but these questions are important to ask. We can look forward to many future articles in *Journal of Marketing* that address these questions.

Whenever major changes occur in a society and we must decide what to do, recall Peter Drucker's (1958, p. 252) view of the purpose of marketing: "Marketing is the process through which economy is integrated into society to serve human needs."

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Deborah J. MacInnis

A Framework for Conceptual Contributions in Marketing

Conceptual advances are critical to the vitality of the marketing discipline, yet recent writings suggest that conceptual advancement in the field is slowing The author addresses this issue by developing a framework for thinking about conceptualization in marketing A definition of conceptualization is followed by a typology of types of conceptual contributions The types of conceptual contributions, their similarities and differences, and their importance to the field are described Thinking skills linked to various types of conceptual contributions are also described, as are the use of tools that can facilitate these skills The article concludes with a set of recommendations for advancing conceptualization in our field in the years to come

Keywords conceptual thinking, conceptual articles, theory, novel ideas

The 75th anniversary of Journal of Marketing (*JM*) is a fitting time for reflection on the vitality of our field, and, in particular, on its conceptual advances More than 25 years ago, Zaltman (1983, p 1) noted that although "the quality of our research primarily follows the quality of our ideas, the quality of our ideas needs improvement" These observations are in accord with those of the 1988 AMA Task Force on the Development of Marketing Thought, which advocated increased research on conceptualizations that enhance marketing thought Yet in the intervening years, scholars have suggested that methodological and empirical advances have outpaced the field's conceptual advances (e g , Kerin 1996, Stewart and Zinkhan 2006, Webster 2005, Zaltman, LeMasters, and Heffring 1985) Perhaps emblematic of this issue is the status of purely conceptual articles (e g , integrative perspectives, reviews, propositional inventories) in our top journals MacInnis (2004) observes a precipitous yet relatively recent decline in the number of such papers Yadav (2010), who replicates these observations, proposes that this decline is detrimental to the field's advancement because conceptual articles not only provide new ideas but also are disproportionately more influential (e g , in terms of citations and awards) than empirical papers Moreover, Yadav notes that conceptual articles play an important role along the discovery–justification continuum that characterizes the knowledge development process (Hanson1958) For example, whereas propositional inventories lay out areas in which empirical research is needed, and thus contribute to the process of discovery, integrative reviews contribute to the process of justification by validating what is known

These concerns over conceptualization motivate this essay In the pages that follow, I propose that our potential for making conceptual advances may be fostered by gaining clarity on (1) what conceptualization means, (2) the entities to which conceptualization applies, (3) what types of conceptual contributions academic scholarship can make, (4) what criteria should be used to evaluate the quality of conceptual ideas, and (4) how we and our future students can hone our conceptual thinking skills The essay proceeds in four parts

First, I define "conceptualization" and develop a novel typology of conceptual contributions that can guide academic research in marketing The typology shown in Table 1 suggests that conceptualization can pertain to various entities, emphasizing smaller units (e g , constructs) to very large units (e g , science itself) (see the rows in Table 1)

Second, I argue that for each entity, conceptualization can contribute to knowledge in one or more ways, as noted in the column headings of Table 1 These types of contributions include envisioning new ideas, relating ideas, explicating ideas, or debating ideas Within each of these four broad types of conceptual contributions, there are two subtypes that reflect contributions either to the process of discovery or to the process of justification For example, envisioning encompasses contributions that add to the process of discovery by identifying something new Envisioning also encompasses contributions that add to the process of justification by using new information, facts, or observations to revise an existing idea Table 2 expands on the meaning of these more specific types of conceptual contributions

I also discuss criteria along which different types of conceptual contributions can be judged (see also Table 2) One criterion noted in Table 2 is that of "interestingness" Murray Davis (1971) suggests that "interesting" ideas challenge strongly held assumptions about the state of the world Interesting ideas add insight They are not just new, they provide different perspectives that alter others' thinking For example, if we were to believe that consumers tend to hold strong attitudes only when they think deeply about

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TABLE 1
Types of Conceptualization and Entities Around Which Conceptualization Can Occur

General Conceptual Goal	Envisioning		Explicating		Relating		Debating	
Specific Conceptual Goal	**Identifying**	**Revising**	**Delineating**	**Summarizing**	**Differentiating**	**Integrating**	**Advocating**	**Refuting**
Entities around which conceptualization occurs								
Constructs (measurable theoretical concepts)								
Relationships/theories (linkages among constructs)								
Procedures (ways of conducting research)								
Domains (areas of study that include constructs, theories, and procedures)								
Disciplines (collections of domains that specify what a discipline studies)								
Science (the activity disciplines perform in the pursuit of knowledge)								

TABLE 2
Detailed Description of Types of Conceptual Contributions

General Conceptual Goal	Envisioning		Explicating		Relating		Debating	
Specific Conceptual Goal	**Identifying**	**Revising**	**Delineating**	**Summarizing**	**Differentiating**	**Integrating**	**Advocating**	**Refuting**
Meaning	To see that something exists, to apprehend, notice, or behold	To see something that has been identified in a new way, to reconfigure, shift perspectives, or change	To detail, chart, describe, or depict an entity and its relationship to other entities	To see the forest for the trees, to encapsulate, digest, reduce, or consolidate	To see types of things and how they are different, to discriminate, parse, or see pieces or dimensions that comprise a whole	To see previously distinct pieces as similar, often in terms of a unified whole whose meaning is different from its constituent parts, to synthesize, amalgamate, or harmonize	To endorse a way of seeing, to support, justify or suggest an appropriate path	To rebut a way of seeing, to challenge, counterargue, contest, dispute, or question
Metaphorical role of the researcher	The astronomer	The artist	The cartographer	The astronaut	The naturalist	The architect	The guide	The prosecutor
Metaphorical tool	The telescope	The paintbrush	The map	The space ship	The magnifying glass	Architectural plans	The compass	The evidence
Common name applied to contribution	Novel framework, new perspective	Revised perspective, alternative view	Conceptual framework, structural framework, propositional inventory	Review paper	Typological/taxonomic framework, classification scheme	Integrative framework	Position paper	Critique/rejoinder/commentary
Evaluative criteria based on execution	Make us aware of what we have been missing and why it is important, reveal what new questions can be addressed from identifying the entity	Identify why revision is necessary, reveal the advantages of the revised view and what novel insights it generates, maintain parsimony	Describe what the entity is, why it should be studied, and how it works (e g , its antecedents, processes, moderating factors), provide a roadmap for future research	Circumscribe what falls within and outside the scope of the summary, develop an organizing framework, comprehensive in article inclusion, provide clear, accurate, and relevant conclusions, simplify through reduction, develop research priorities	Indicate how entities are different and why differentiation matters, indicate what novel insights can be gleaned or what findings can be reconciled from differentiation	Accommodate extant knowledge, explain puzzling or inconsistent findings, reveal novel insights, create parsimony	Clearly state the issue and one's perspective on that issue, state premises and assumptions, provide credible and unambiguous evidence, draw conclusions that support the advocated view, avoid fallacious reasoning errors	Clearly state the issue and one's perspective on that issue, state premises and assumptions, provide credible and unambiguous evidence, draw conclusions that are consistent the refuted view, avoid fallacious reasoning errors

TABLE 2
Continued

General Conceptual Goal	Envisioning		Explicating		Relating	
Specific Conceptual Goal	**Identifying**	**Revising**	**Delineating**	**Summarizing**	**Differentiating**	**Integ**
Evaluative criteria based on interestingness, suggest that	What is unseen is seen, what is unobservable is observable, what is unknown is known, what does not matter, matters a great deal	What is seen, known, observable, or known can be seen differently	What is simple is complex, what is micro is macro, what is unrelated is related, what is holistic is particularistic	What is complex is simple, what is macro is micro, what is unrelated is related, what is particularistic is holistic	What is similar is different, what is inseparable is separable, what is organized is disorganized, what is one-dimensional is multidimensional, what is homogeneous is heterogeneous	What is is simila is separ insepara what is nized is nized, w multidim sional is dimensi what is geneou homoge
Similarities in thinking skills and facilitating tools	Divergent thinking facilitated by search for metaphors, questioning assumptions, look for hidden events and outliers, engage in introspection		Logical reasoning facilitated by mapping		Comparative reasoning f by Venn diagrams and co son matrices	
Differences in thinking skills and facilitating tools	Beginner's mind facilitated through "taking a hike," immersion in other people's views	Expert's mind and a beginner's mind facilitated by finding anomalies, questioning assumptions, heuristic references	Deductive reasoning facilitated by theories in use	Inductive reasoning facilitated by outlines	Analytical reasoning facilitated by analogies and metaphors	Analog resonin facilitat analogi metaph

an attitude object, an interesting idea would be one that affirms the opposite—namely, that consumers tend to hold strong attitudes only when they do not think deeply about an attitude object Davis identifies 12 ways that ideas can be interesting (see also Zaltman, LeMasters, and Heffring 1985) Notably, and as Table 2 shows, the current typology accommodates these ways (and more) but expands on Davis's work by linking the interestingness criteria to the various conceptualization types

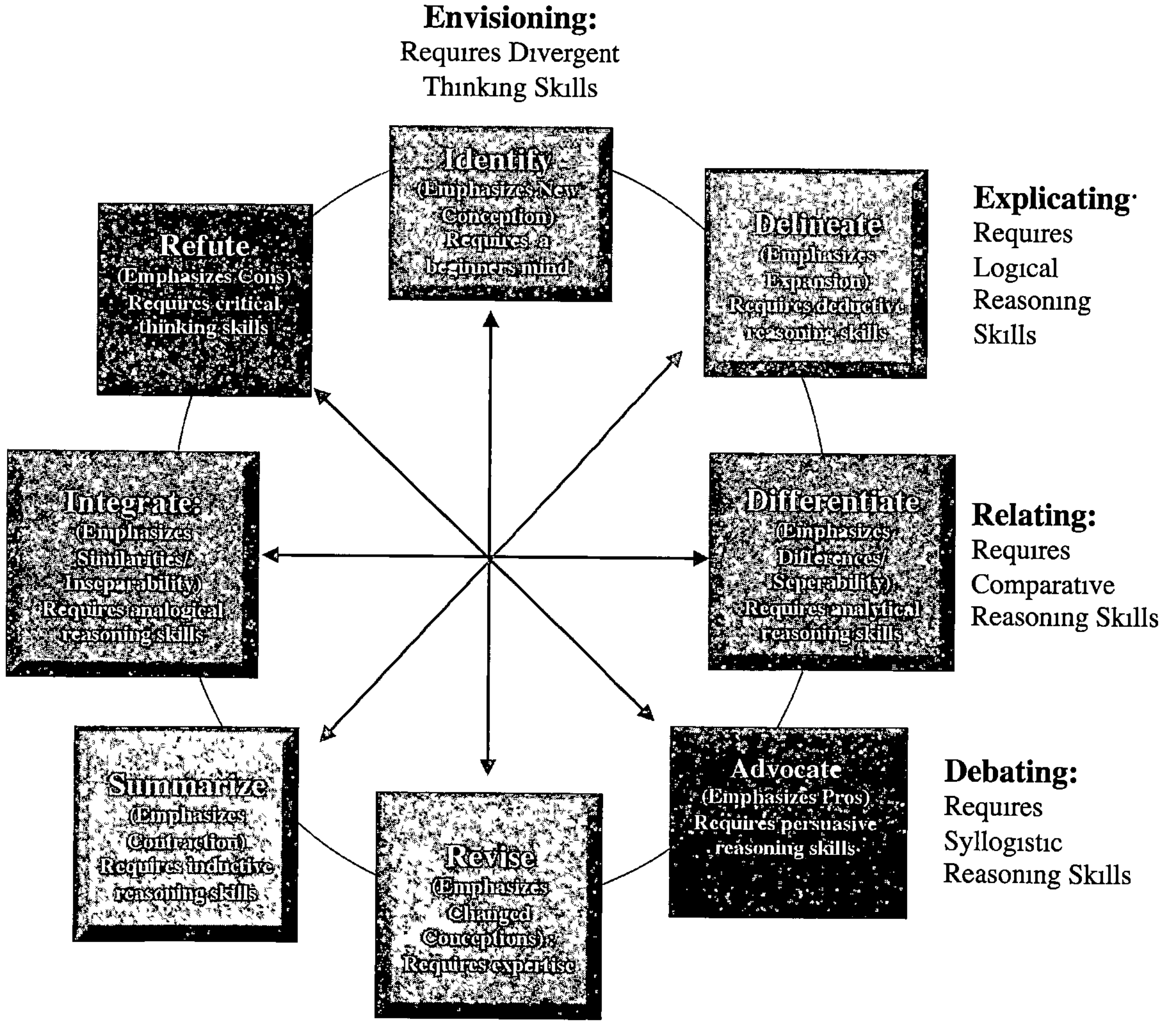
If the types of conceptual contributions noted in Table 1 are critical to the development of the field, it becomes important to understand what types of thinking skills and facilitating tools underlie each contribution type By understanding these thinking skills and how they may be developed, we may be in a better position to enhance conceptualization Table 2 and Figure 1, which constitute the third part of this article, describe these issues In the fourth and final section, I conclude with recommendations pertinent to the next 75 years of marketing thought

Conceptualization

Conceptualization is a process of abstract thinking involving the mental representation of an idea Conceptualization derives from the Medieval Latin *conceptuālis* and from Late Latin *conceptus*, which refer to "a thought, existing only in the mind, separated from embodiment" (*American Heritage Dictionary* 2003) Thus, conceptualization involves "seeing" or "understanding" something abstract, in one's mind

Conceptual thinking, then, is the process of understanding a situation or problem abstractly by identifying patterns or connections and key underlying properties Such thinking can include a range of information-processing activities, among which are inductive and deductive reasoning, logical reasoning, and divergent thinking skills Conceptual thinking may involve the visual representations of ideas in the form of typologies, process models, figures, flow charts, or other visual depictions However, such representations are

FIGURE 1
Critical Skills Necessary for Conceptual Thinking


Envisioning:
Requires Divergent Thinking Skills
Identify (Emphasizes New Conception) Requires a beginners mind
Explicating: Requires Logical Reasoning Skills
Delineate (Emphasizes Expansion) Requires deductive reasoning skills
Refute (Emphasizes Cons) Requires critical thinking skills
Integrate: (Emphasizes Similarities/ Inseparability) Requires analogical reasoning skills
Relating: Requires Comparative Reasoning Skills
Differentiate (Emphasizes Differences/ Seperability) Requires analytical reasoning skills
Debating: Requires Syllogistic Reasoning Skills
Advocate (Emphasizes Pros) Requires persuasive reasoning skills
Summarize (Emphasizes Contraction) Requires inductive reasoning skills
Revise (Emphasizes Changed Conceptions); Requires expertise

better regarded as outputs than as defining characteristics of conceptual thinking. Most academic articles (including those that take conceptual ideas and test them empirically) involve conceptualization. Identifying interesting problems, developing hypotheses, interpreting data, and deriving implications all involve thinking conceptually. Thus, conceptual thinking is at the heart of the scientific enterprise; it is critical to the development of both an individual scientist and the field of endeavor.

Conceptual articles are academic articles devoted purely to thought-based conceptions that are devoid of data (see MacInnis 2004, Yadav 2010). A differentiation is often made between conceptual and empirical articles (Elder and Paul 2009, MacInnis 2004), such that the latter include data. For example, purely conceptual articles include "conceptual frameworks," "integrative models," and "state-of-the art" reviews. Purely analytical (mathematical) articles are also examples of conceptual articles; here, ideas are represented mathematically as opposed to verbally. Purely empirical papers emphasize data mining. Other papers blend the conceptual with the empirical. For example, hypothesis-driven papers begin with conceptual ideas and test them empirically. Ethnographic papers often begin with data and use those data to build conceptual ideas. Meta-analyses also begin with data (individual papers) and use those data to understand generalizable relationships and their moderating factors.

Types of conceptual contributions, which are at the heart of this article, reflect ways in which contributions are realized. I describe such contribution types, which are represented in the columns of Table 1, in greater detail subsequently. Suffice it to say for now that (1) all contribution types reflect "seeing" or "understanding" something new in an abstract way, (2) they can pertain to the different entities shown in the rows of Table 1, (3) they reflect the nature of the research contribution and thus the criteria on which it is judged (as shown in Table 2), and (4) they differ in the conceptual skills they entail and the facilitating tools that enable them (see Table 2 and Figure 1).

Entities Around Which Conceptual Advances Can Occur

Conceptual advances can be made with respect to the entities labeled in Table 1 as constructs, relationships/theories, procedures, domains, disciplines, and science. I describe these entities in greater detail in the following subsections.

Constructs. Constructs are abstract, hypothetical concepts that are defined in a sufficiently precise manner (often along some dimension) to be operationalized or measured. For example, attitude strength, attitude valence, and attitude persistence are each unique constructs. Although all are reference "attitudes," they vary in whether the attitude is being conceptualized in terms of the confidence with which it is held (its strength), the degree to which it is favorable or unfavorable (its valence), or the degree to which is held consistently over time (its persistence).

Conceptual development pertaining to constructs is significant to academic and practitioner audiences for several reasons. First, "we see and understand things according to the concepts we have and [we] filter our observations through concepts" (Niehoff 1998, pp. 1–2; see also Zaltman, LeMasters, and Heffring 1985, p. 18). Thus, constructs play a critical role in knowledge representation, perspective taking, and knowledge sharing. Second, constructs "enable us to identify, compare, and distinguish dimensions of our thinking and experience. We can never achieve command of our thoughts unless we achieve command over (properly conceptualize) the concepts and ideas in which our thought is expressed" (Elder and Paul 2009, p. 10). Third, constructs have action significance because construct labels help academics and practitioners categorize situations and decide what to do. The better marketers can understand what something is, the more effectively they can deal with it. Fourth, constructs are critical because they reflect basic units of knowledge advancement. Without conceptualizing new constructs, we would study the same constructs over and over again, limiting our perspectives on the world. Finally, the conceptualization of constructs is critical because constructs form the basis on which measures are derived and from which theories are tested. Given their centrality to knowledge advancement, several papers have articulated processes for developing "good" constructs (e.g., MacKenzie 2003, Teas and Palan 1997).

Relationships/theories. Knowledge advancement occurs not only by studying and developing constructs but also by conceptualizing their relationship to other concepts, often in a nomological network. Relationships that specify why one (or more) construct affects other constructs are called theories. Theories can also specify when (the conditions under which) and how (the process by which) given outcomes are affected. Thus, theories often include moderators and mediators as part of their specification.

Conceptual advances related to theories are also critical to both academics and managers. First, conceptualizing relationships in terms of a theory helps clarify the workings of the world around us. Second, understanding *why* fosters better prediction of the outcomes that managers care about. Thus, by conceptualizing relationships in terms of a theory, marketers can better understand how to manipulate or arrange environments so that desired outcomes can be realized. Such understanding also enables the development of process measures that have value in diagnosing whether a person is on course and what must be done to correct off-course deviations. Third, conceptual advances pertaining to theories help refine our understanding of the world by understanding the conditions under which actions will or will not produce desired outcomes. Finally, conceptual advances in theories are critical to knowledge development; theory revision avoids "saturation" (Zaltman, LeMasters, and Heffring 1985), or an emphasis on incremental tests of theories rather than the development of new ideas. Given the importance of conceptual advances pertaining to theories, researchers have given considerable thought to what constitutes a "good" theory (e.g., Darden 1991, Dennis and Kintsch 2007, Zaltman, Pinson, and Angelmar 1973).

Procedures. Some conceptual advances contribute to knowledge by articulating procedures or "best practices" for executing strategies or tactics, often with the goal of solving problems. Such procedures may be kinds of theories in that they are based on implicit or explicit theories about what will work. However, conceptual advances regarding procedures foster knowledge development by specifying how an activity should be done, often through a normative lens. Conceptual contributions at the procedure level can be of particular value to marketing practitioners who seek input on best practices. Conceptual advances related to procedures may involve identifying a new procedure, describing its implementation and/or the nature and range of the problems it solves, indicating how it solves the problems inherent in other procedures, and revealing the novel insights it can generate, the assumptions it makes, and the conditions under which it is most or least likely to be functional.

Domains. A domain is an area of study. In anthropology, domains include culture, customs, ethnocentrism, and kinship (Niehoff 1998). In psychology, domains such as attitudes, emotions, and memory assume centrality. Marketing studies domains such as relationships, services, competition, choice, strategic planning, price, and advertising. Domains are not constructs. Rather, they are broad categories of study within which specific constructs, theories, and/or procedures can be articulated. Different domains often have "different purposes, questions, information, concepts, theories, assumptions, and implications" (Elder and Paul 2009, p. 21). Domains are socially constructed, meaning that the academic or practitioner communities decide what a domain entails. Domains can encompass macrolevel phenomena (competition in the marketplace) or microlevel phenomena (e.g., preattentive processing). Moreover, domains can be hierarchically linked to other domains. For example, the domain of "consumer emotions" is part of a larger domain called "affect." Within the emotion domain, subdomains, such as "anticipated emotions," "experienced emotions," and "retrospective emotions," can be identified.

Conceptual advances at the domain level are also critical to marketing academics and practitioners. They contribute to a field's vitality by opening new and unexplored areas of study. Conceptual advances within a domain foster spheres of competence and expertise. Practitioners often rely on academics for making conceptual advances in a domain. Evidence of such advances can form the basis for practitioners' desires to connect with academic audiences. Thus, conceptual advances within a domain connect members of knowledge communities, which in turn fosters knowledge diffusion and sharing.

Disciplines. The domains and the procedures utilized in field of research constitute a discipline. Thus, the academic discipline of marketing represents the amalgamation of domains pertinent to exchange (Bagozzi 1975). Within this discipline are subdisciplines, including "consumer behavior," "marketing strategy," and "marketing models." Disciplines are the units of analysis for universities, and hiring strategies are typically organized around disciplines. Disciplines are critical for managers because disciplines have degree-granting bodies (departments and schools) that certify the breadth and depth of potential employees' knowledge and thus validate their potential to enter the workforce (MacInnis and Folkes 2010). Conceptual advances within disciplines help identify research priorities and indicate ways that research in the field needs to shift to adapt to changing environments.

Science. Finally, conceptual advances can be made at the level of science. In marketing, discussions about science and the philosophy of science became salient in the 1980s and early 1990s, driven in part by alternative perspectives on the philosophy and sociology of science (e.g., Kuhn 1962). Conceptual contributions at the level of science clarify what constitutes science, what differentiates science from nonscience, and what processes are involved in scientific research (i.e., what makes for "rigorous" research and whether theories can be proved). Whereas procedures may be specific to an academic discipline or domain, contributions at the level of science are independent of discipline. Although practitioner audiences may be less concerned with conceptual contributions at the level of science, such contributions are important for academic researchers and doctoral students whose membership in the scientific academic community specifies rules of conduct to be followed in executing scientific research.

Types of Conceptual Contributions

For each of the aforementioned entities, researchers can make conceptual contributions in any number of ways (Table 1). The columns of Table 2 present four types of conceptual contributions (envisioning, relating, explicating, and debating). Within each type, I identify two subtypes, which I describe subsequently and summarize in the rows of Table 2. Various cells of Table 1 are illustrated using examples of frequently cited conceptual articles.[1] I begin by describing the more specific conceptual contributions (e.g., identification and revision) so that their linkage to the broader contributions (e.g., envisioning) can be more clearly understood. My discussion of these contributions includes a description of the criteria by which "good" papers of this type can be judged. These criteria serve as guidelines for authors who write and readers who review papers. Although the contributions are different, all move the field forward by setting an agenda for further research.[2]

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[1] My expertise in consumer behavior inclines me to report on conceptual articles based on verbal arguments versus those based on mathematical arguments (analytical models). However, the value of analytical models cannot be disputed. Their lack of representation here merely reflects the limitations of my knowledge.

[2] Some conceptual papers (including those described here) make several types of conceptual contributions. For example, Srivastava, Shervani, and Fahey (1998) propose a revised view of the marketing discipline, suggesting that marketing's role is to create and manage market-based assets that deliver shareholder value. They also differentiate two types of market-based assets—relational and intellectual—as well as the attributes of balance sheet and off–balance sheet assets. Reflective of delineation, they propose that market-based assets (e.g., customer relationships, partner relationships) affect various aspects of market performance, which in turn affect shareholder value.

Identifying Versus Revising: Contributions That Involve Envisioning

Identifying seeing that something exists Researchers who make contributions through identifying establish or make known something that has yet to be established The goal is to introduce a construct, theory, procedure, domain, discipline, or aspect of science that has yet to be apprehended or given serious study As Table 2 shows, a metaphor for a researcher whose contribution involves identification is one of an astronomer who uses a powerful telescope to identify stars, planets, or galaxies that had previously been unseen Purely conceptual papers that contribute in this manner are often titled with words that connote originality, for example, a novel framework or a new perspective

Identification can occur for any of the entities in the rows of Table 1[3] To illustrate, Glazer (1991) identifies a novel *construct* called "information intensity" He proposes that at one end of the information intensiveness continuum are products that are completely information independent At the opposite end are information-based products The latter may have been used initially to market a product but have since become marketable products themselves The continuum is important because it characterizes the degree to which information is a wealth-generating asset in its own right Hunt and Morgan (1995) present a novel "comparative advantage" *theory* of competition The proposed theory suggests that competition is based on comparative advantage, defined as the relative resource-produced value by the firm in relation to the relative resource costs it incurs Holbrook and Hirschman (1982) articulate a novel *domain* of consumer research, arguing that an overreliance on rational decision making and consumer information processing has blinded researchers to the role of feelings, fantasies, and fun in consumers' decision making Day and Montgomery (1999) identify three novel "*discipline-based issues*" that the academic marketing discipline would face upon entering the new millennium (1) providing meaningful measures, inferences, and calibration, (2) crossing boundaries and understanding functional interfaces, and (3) rethinking the role of theory

As Table 2 shows, articles that contribute to identification make us aware of what we have been missing This can be accomplished by providing evidence that the identified entity is real and moreover that its study is important Reality and significance are often illustrated by reference to real-world problems, issues, or observations (see Day and Montgomery 1990, Glazer 1991) In some cases, these real-world examples reveal what is missing by comparison to prevailing views (Holbrook and Hirschman 1995, Hunt and Morgan 1995) In still other cases, they identify a novel entity by pointing to aligned research areas that have failed to intersect For example, Ward (1974) argues that whereas marketing academics have studied consumers and developmental psychologists have studied children, the field of consumer behavior had yet to examine children's learning as it pertains to the marketplace—a domain he labels "consumer socialization" Good papers also reveal what new insights can be gained from the entity's study Good papers provide clear and unambiguous definitions of the identified entity They are also generative, they guide future research by indicating novel research questions fostered from identification These latter two characteristics are true of all papers that contribute conceptually, including those described subsequently

Revising seeing what has been identified in a different way Revision involves reconfiguring or taking a novel perspective on something that has already been identified Thus, whereas identifying is consistent with the logic of discovery, revision takes empirical evidence on the identified entity into account and modifies it Contributions based on revising gain insight from alternative frames of reference The visual metaphor might be that of an artist who uses a paintbrush to depict a landscape as a series of colored dots (as in pointillism) or a series of shapes (as in cubism) A different visual metaphor is that of a person who turns a dial on a kaleidoscope to reveal a new image Common labels for purely conceptual papers with this goal are revised perspectives or alternative views

To illustrate, Shugan (1980) presents a revised perspective on the *construct* of information costs Whereas traditional economic models assumed that information was provided at no cost to consumers, Shugan views information as costly His reconceptualization has made it possible to assess the costs of various decision-making strategies or rules It also helps us understand when consumers are likely to make suboptimal choices from limited decision making Anderson's (1982) "theory of the firm" provides a different *theoretical* perspective from which to understand organizational issues in marketing MacInnis, Moorman, and Jaworski (1991) reconceptualize the *domain* of advertising executional cues Rather than categorizing cues as "central" or "peripheral," the authors conceptualize cues in terms of their potential to enhance consumers' motivation, ability, and opportunity to process information Webster (1992) suggests reconceptualizing the marketing *discipline* His reconceptualization moves away from a focus on profit maximization and transactions and toward a view of marketing that emphasizes long-term relationships with customers, strategic alliances, and partnerships Also from the standpoint of the marketing *discipline*, Van Waterschoot and Van den Bulte (1992) offer a revised perspective on the marketing mix—one that overcomes the limitations of the prevailing four P scheme Finally, at the level of *science*, Thompson, Locander, and Pollio (1989) provide a revised (existential phenomenology) paradigm for understanding the consumer experience In contrast with the extant Cartesian view (rooted in logical positivism), the revised view regards consumer experiences in context, understanding experiences as they are lived

As Table 2 shows, good papers that contribute through revision can be evaluated according to the following criteria They should describe the need for a revised perspective

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[3] To prevent tedium in reading, I do not attempt to provide illustrations of each individual cell in Table 1 The goal is to provide illustrative examples that clarify the meaning of the type of conceptual contribution

In some cases, this is accomplished by revealing and questioning the validity of hidden or explicit assumptions, foundational premises, or tenets in the extant view and indicating their limiting features In other cases, they reveal the prevailing metaphor used to guide thinking and illustrate its limitations in understanding the entity (see Thompson, Locander and Pollio 1989) Relaxing or altering these assumptions or using a different metaphor reveals what novel insights can be gained from the revised perspective (Shugun 1980) In still other cases, the need for a revised perspective is reinforced by reference to dynamic changes in firms or the marketplace that make the prevailing view outdated (see Hoffman and Novak 1996, Webster 1992) Good papers also indicate what new issues the revised view provides that the extant view cannot accommodate They may also show how the new perspective provides a different way of understanding the meaning of various findings (MacInnis, Moorman, and Jaworski 1991) or activities (Peter and Olson 1983) Good papers that make contributions to a domain may also reveal aspects of identification, in that the new perspective may identify novel constructs, theories, and procedures that have yet to be studied

Similarities and differences between identifying and revising Conceptual contributions based on identifying and revising are similar yet distinct, in the ways noted in Table 2 Identifying something new and providing a revised perspective are similar in that both involve "envisioning"—that is, conceiving a new reality Yet identifying is more closely related to the context of discovery because it involves observing that reality for the first time In contrast, revision is more strongly related to the context of justification because it takes what is known or presumed to be and sees it differently Identifying and revising also reflect opposing criteria of interestingness, as shown in Table 2 Articles that contribute through identification are interesting by suggesting that what is unseen is seen, what is unobservable is observable, what is unknown is known, or what does not matter actually matters a great deal Articles that contribute through revision are interesting by suggesting that what is seen, known, observable, or of importance can be seen differently or by suggesting that what matters a great deal matters for a different reason than what was previously believed

Delineating Versus Summarizing: Contributions that Involve Explicating

Delineation detailing an entity Delineation entails the goal of detailing, articulating, charting, describing, or depicting an entity Often, this charting helps researchers consider how the entity they study (e g , their "hometown") relates to the broader conceptual world around it Papers aimed at delineation put the researcher in the metaphorical role of a cartographer, whose goal is to gain better grounding on a focal entity by mapping it out Papers with a goal of delineation are often called conceptual frameworks, structural frameworks, or propositional inventories that describe an entity and identify things that should be considered in its study

To illustrate, MacInnis and De Mello (2005) delineate the *construct* of hope, describing its implications for evaluation judgments, satisfaction processes, and risk taking At the level of *relationships and theory*, Parasuraman, Zeithaml, and Berry (1985) delineate factors that drive consumers' perceptions of service quality (e g , gaps between customers' perceptions and marketers' actions) Churchill's (1979) classic article on the development of marketing measures details a *procedure* for developing marketing measures Frazier (1983) delineates the *domain* of interorganizational exchange behavior in marketing channels, articulating factors that affect the initiation of interorganizational exchanges, the processes involved in reviewing whether such exchanges should be enacted, the processes involved in implementing the exchange, and the outcomes of each of these processes Alba and Hutchinson (1987) delineate the domain of consumer expertise They examine the impact of expertise on a set of cognitive processes that include cognitive effort and automaticity, cognitive structure, analysis, elaboration, and memory They develop logically derived hypotheses about the antecedents and consequences of expertise and factors that characterize experts as opposed to novices Sherry (1983) delineates the domain of gift giving He articulates the social, personal, and economic underpinnings of gift giving and develops a model of the gift giving process

As Table 2 shows, "good" papers that contribute through delineation detail what the entity under study is (MacInnis and De Mello 2005), why its study is important, and how it changes or the processes by which it operates or is executed (Churchill 1979, Frazier 1983, Parasuraman, Zeithaml, and Berry 1985, Sherry 1983) Such papers may also consider what factors circumscribe the entity's study or moderating conditions that may affect it (Alba and Hutchinson 1987) They provide a roadmap for understanding the entity, sometimes in the form of boxes and arrows that demonstrate cause and effect relationships (Frazier 1983), pictorial models that depict processes (Sherry 1983), or propositional inventories or novel hypotheses (Alba and Hutchinson 1987)

Summarization seeing the forest for the trees The goal of summarization is to take stock of, digesting, recapping, and reducing what is known to a manageable set of key takeaways Whereas delineation often specifies what relationships might exist (consistent with the context of discovery), summarization typically takes empirical evidence into account to derive conclusions about what is known (consistent with the context of justification) As Table 2 suggests, the visual metaphor of the researcher is one of an astronaut whose view from the spaceship allows him or her step back from the mountains, deserts, cities, and seas to see Earth in its entirety Purely conceptual papers with the goal of summarization are commonly labeled review papers or critical syntheses (empirical papers with this goal are called meta-analyses)

For example, Gardner (1985) summarizes what is known about the *construct* of mood in consumer behavior She reviews various mood induction methods and discusses the direct and indirect effects of positive mood on consumer behavior, memory, and product evaluation She also reviews what is known about service encounters, point-of-purchase stimuli, and communications as factors that may affect consumers' moods in the marketplace Rindfleisch and Heide (1997) summarize research that draws on transaction cost analysis *theory* Wright (1980) reviews research on the use of thought verbalization *procedures* (support arguments, counterarguments, source derogations) in persuasion research Kerin, Varadarajan, and Peterson (1992) review empirical studies on the *domains* of order of entry and first-mover advantages Folkes (1988) reviews what is known about attributions in consumer behavior Wilkie and Moore (2003, see also Kerin 1996) summarize how the *marketing discipline* has changed across time, they summarize prior work by clustering it into four broad "eras" of marketing thought Reviews such as the *Annual Review of Psychology*'s consumer behavior reviews (e g , Loken 2005) summarize what is known about a *discipline* or subdiscipline

As Table 2 shows, papers that contribute through summarization indicate why summarization is needed or is particularly timely They circumscribe what falls within and outside the entity encompassed in the review, from the standpoint both of a substantive focus and of sources and time frames along which their summary relies (Rindfleisch and Heide 1997, Wilkie and Moore 2003) They often develop a useful organizing framework within which the summarized material can be couched and logically linked For example, as mentioned previously, Wilkie and Moore (2003) organize the field of marketing in terms of eras Gardner (1985) organizes mood research in terms of what is known about effects in different contexts (e g , service encounters, marketing communications) Folkes (1988) organizes her review on attributions in terms of antecedents and consequences Good papers are comprehensive in reviewing the papers that meet inclusion criteria, and their conclusions are clear, accurate, and consistent with the data at hand They identify knowledge gaps and lay out research priorities (Folkes 1988, Rindfleisch and Heide 1997) They may also develop managerial implications that pertain to the summarized findings (Gardner 1985)

Similarities and differences in delineating and summarizing Both delineating and summarizing involve explication—that is, articulating, explaining, or drawing out ideas and relationships (see Table 2) Both also emphasize generalities and abstractions as opposed to particulars Thus, whereas studying exceptions are appropriate for contributions based on envisioning (identifying or revising), such study is not the goal of delineation or summarization Delineation and summarization emphasize the rule, not the exception Both can involve statements of relationships—though with delineation, such statements may be in the form of hypotheses, while summarization statements are in the form of generalizations

Delineation and summarization are different, however Delineation involves mapping or charting what might be (e g , what a construct might entail, what a domain might encompass, what relationships might exist), as would be true with the context of discovery In contrast, summarization involves taking stock of what is empirically known from many disparate instances, as would be true with the context of justification They also differ in that delineation involves expansion, by mapping out the components of a construct, theory, or domain In contrast, summarization emphasizes contraction, or the distilling of many empirical instances to a set of manageable conclusions

As Table 2 suggests, delineation and summarization have parallel bases for interestingness Interesting ideas aimed at delineation suggest that what is simple is complex, what is micro is macro, what is small is big, and what seems to be unrelated is actually related In contrast, when it comes to summarization, interesting ideas are those that suggest that what is complex is simple, what is big is small, and what is idiosyncratic is general

Differentiating Versus Integrating: Contributions that Involve Relating

Differentiation seeing differences Differentiation involves conceptual advances that add insight by distinguishing, parsing, dimensionalizing, classifying, or categorizing an entity (e g , construct, theory, domain) under study The goal of differentiation evokes a visual metaphor of a naturalist who uses a magnifying glass to classify and categorize flora and fauna into various taxonomic and hierarchical categories Purely conceptual papers with the goal of differentiation are sometimes labeled typological, taxonomic, or classificational frameworks (Bailey 1994, Doty and Glick 1994) Several illustrations follow

Houston and Rothschild's (1978) unpublished but often-cited paper brought great clarity to the involvement *construct* by suggesting the need to differentiate among the entities with which one could be involved a brand, product, response, or situation This differentiation was viewed as critical because involvement in one entity (e g , a brand) did not necessarily imply involvement in a different entity (e g , a product category) Moreover, theories about one construct (brand involvement) may be inappropriately applied to theories of a different construct (e g , ad involvement) At the level of *procedure*, Jarvis, MacKenzie, and Podsakoff (2003) argue that there is a critical distinction between using formative versus reflective indicators of constructs They differentiate the two and develop a set of procedures to help researchers identify when each should be used They suggest that failure to specify construct indicators correctly as either formative or reflective has resulted in model misspecification in prior marketing research Lovelock (1983) suggests that the *domain* of services can be differentiated in terms of the nature of the service act (whether it deals with tangible or intangible actions), who receives the service (people or things), the nature of the service delivery (discrete or continuous), and the presence or absence of a relationship between the firm and customers (membership relationship or no formal relationship) Likewise, the domain of "affect" can be decomposed into subcategories of emotions, mood, and attitudes (Cohen and Areni 1991) At the level of *science*, Calder, Phillips, and Tybout (1981) argue for the need to differentiate research goals in terms of whether they are designed to apply effects (to determine whether effects generalize to a different setting) or to determine whether theory can be generalized to different settings They argue that this distinction is important because the two goals represent different philosophical and scientific approaches to the conduct of research.

Papers that contribute through differentiation demonstrate how entities are different. They may do so by revealing the underlying dimensions along which entities can be compared or by recognizing their differing antecedents, manifestations, or effects. For example, Calder, Phillips, and Tybout (1981) compare effects-oriented and theory-oriented research in terms of differences in selecting respondents, operationalizing independent and dependent variables, choosing a research setting, and selecting a research design. Good papers also articulate why differentiation matters. Differentiation may matter because seeing the differences adds clarity, reduces confusion, or makes sense of out of what were previously regarded as inconsistent effects (Houston and Rothschild 1978) or viewpoints (Calder, Phillips, and Tybout 1981). Differentiation may matter because it adds precision to thinking, making it easier to compare findings across papers, or it may matter because lack of differentiation creates errors in reasoning about entities or developing findings that pertain to them. In other cases, differentiation matters because the articulation of differences helps identify novel contingencies. For example, classifying services in terms of the extent to which they involve a discrete or continuous set off transactions (Lovelock 1983) adds new insight into the conditions under which being market driven matters.

Integration: seeing the simplicity from the complex. Like revision, integration involves seeing something in a new way, and like summarization, it involves a holistic perspective. However, true integration does more than lay out what has been found. It takes what is known and has been theorized and transforms it into something entirely new. Integration draws connections between previously differentiated phenomena, finding a novel, simplified, and higher-order perspective on how these entities are related. Integration involves synthesis—that is, the creation of a whole from diverse parts. Integration leads to overarching ideas that can accommodate previous findings, resolve contradictions or puzzles, and produce novel perspectives. Thus, integration provides a simple and parsimonious perspective that accommodates complexity. The metaphorical role of the researcher is that of an architect who creates a new building from a set of pipes, cement, steel, wiring, and windows. The metaphorical tool is the architectural plan that both depicts the building in its entirety and notes how the building's specific elements fit together to make this novel structure. Common words for papers that make such contributions are integrative frameworks—though that term is sometimes (perhaps inappropriately) applied to papers that actually emphasize delineation or summarization.

Belk (1988) provides an integrated perspective on the *construct* of possessions, suggesting that they are part of our extended selves. This perspective is developed by leveraging research on possessions in self-perception, research on the loss of possessions, and research that demonstrates investment of the self into possessions. Drawing on literature from multiple disciplines, he describes the functions of having an extended self, and he describes processes by which possessions become incorporated into the self. Dickson (1992) develops a *theory* of competitive rationality that integrates other paradigms (e.g., Adam Smith's "invisible hand," Schumpeter's entrepreneurial "creative destruction," Simon's bounded rationality). Petty and Cacioppo's (1986) "elaboration likelihood model" provides an overarching and simplified perspective that accommodates myriad theories of attitude formation. Bettman, Luce, and Payne (1998) develop an integrated theory of consumer choice that blends two perspectives on contingent choice—the effort/accuracy perspective and the perceptual approach. Stern and Reve (1980) propose the "political economy framework" for understanding the *domain* of distribution channels. This framework, which integrates the economic and behavioral approaches to understanding distribution channels, considers the economic and sociopolitical factors that affect distribution channel behavior and performance.

Papers that contribute through integration accommodate extant knowledge. Thus, they account for well-accepted findings while explaining puzzling findings. In this way, they provide clarity by resolving apparent inconsistencies across studies. For example, Petty and Cacioppo's (1986) elaboration likelihood model shows that many of the prevailing theories of attitude formation have validity, yet their value in explaining consumers' attitude formation processes depends on whether consumers' motivation, ability, or opportunity to process information is high or low. Good papers also contribute by noting the parsimony achieved through the integrated perspective. The elaboration likelihood model achieves parsimony by taking the myriad theories of attitude formation processes and suggesting that they fall into two general buckets—those based on thoughtful processing (which occurs when motivation, ability, and opportunity to process information are high) and those based on less thoughtful processing (which occurs when motivation, ability, and/or opportunity to process information are low).

Similarities and differences between differentiating and integrating. The goals of differentiating and integrating are similar insofar as both involve comparing—that is, seeing how wholes and parts are related. Yet differentiation involves comparisons that decompose an entity by breaking it down into its constituent parts and noting contrasts or dimensions along which the entities differ and can be compared. In contrast, integration involves finding links or similarities that connect previously disparate entities; it involves seeing a new whole (e.g., a cake) instead of its constituent elements (flour, sugar, eggs, baking soda, and chocolate). Consistent with the notion that differentiation and integration are different but related forms of reasoning, Gardner (2008), uses the terms "lumpers" and "splitters" to describe people whose thinking style reflects integration and differentiation, respectively. Lumpers are people whose thinking style emphasizes putting things together and finding similarities among them. Splitters are people whose thinking style emphasizes distinctions and contrasts.

As Table 2 shows, these two contribution types have parallel interestingness criteria. In differentiation, ideas are interesting because they suggest that what has been previously regarded as similar is different, what is inseparable is separable, what is unidimensional is multidimensional, what is homogeneous is heterogeneous, what is organized is disorganized, and what is holistic is particularistic. Integration involves the opposite set of interestingness criteria.

Advocacy Versus Refutation: Contributions that Involve Debate

Advocating: endorsing a way of seeing. Advocacy involves argumentation to justify or support a given conclusion. With advocacy, the researcher recommends or pushes for something, or speaks in support of a particular view. The metaphorical role of the researcher is that of a guide who relies on a compass to direct the path forward. The common label for purely conceptual papers that emphasize advocacy is a position paper, an editorial, or a perspective.

Zajonc (1980, see also Zajonc and Markus 1982) advocates a *theory* that in the relationship between affect and cognition, affect is primary—it causes cognitions. Preferences (affect) need not rely on cognition, because preferences can be acquired incidentally and nonconsciously through exposure, as exposure increases, so does affect. To illustrate, Szymanski (1988) argues for the importance of studying declarative knowledge as a critical *domain* that affects sales performance effectiveness. Hunt (1992) advocates a deontological philosophical approach to the academic marketing *discipline*, arguing that the field should be viewed in terms of its responsibilities and obligations. As a discipline within a university, our field's ultimate obligation is to serve society, but its other responsibilities are to serve students, marketing practitioners, and the academy. Also at the level of the *discipline*, Leone and Schultz (1980) suggest that a science of marketing should emphasize marketing generalizations. By identifying such generalizations, we can better understand what we do and do not know. Moreover, a general goal in the science of marketing is to use generalizations to build and modify extant theories.

Refuting: rebutting a way of seeing. In contrast to advocating, refuting involves argumentation aimed at rebutting, challenging, disputing, or contesting a given perspective. The metaphorical role of the researcher is that of a prosecuting attorney whose exhibits to the jury cast doubt on the defendant's innocence. Papers that refute a given perspective are commonly labeled "critiques," "rejoinders," or "commentaries."

To illustrate, Moore (1982) suggests that we abandon further research on the *construct* of subliminal perception in light of evidence suggesting that its impact on consumer behavior is limited. Lazarus (1981) issues one of a series of critiques against Zajonc's *theory*, suggesting that Zajonc's theory of affect primacy underestimates the role of cognition in affect generation. Olshavsky and Granbois (1979) critique the *domain* of "consumer decision making," arguing that in many consumer contexts (budgeting, purchase allocation decisions, store patronage, and brand purchase), decision making does not resemble the classic mode, indeed, decision making appears absent. Sheth (1992) criticizes the *subdiscipline* of consumer behavior for its "unimpressive impact" on understanding consumers, particularly for practitioner and policy audiences.

Similarities and differences between advocacy and refutation. Contributions based on advocacy and refutation are similar because both involve the process of debate—that is, putting forward reasons designed to convince others about the validity of an idea. Debate differs from explication because it is not designed to *explain ideas* but rather to *change beliefs* or alter the confidence with which beliefs are held (Walton 2006). In contrast to explication, both advocacy and refutation involve an assumption that there is an issue or something to be debated, and both involve a stance on that issue. Both also involve an action orientation designed to convert belief systems to be in line with one's own. Both involve a normative orientation reflecting one's perspective on what others should (or should not) believe. Thus, in contrast to the previously discussed contribution types, these types of contributions emphasize change of social opinions.

The criteria that make advocacy and debate papers good are also similar. Good papers state the premises and assumptions on which their argument is based. They put forth evidence that is credible, unambiguous, consistent with the stated conclusion, and not subject to fallacious reasoning. Providing multiple sources of evidence that point to the same conclusion adds validity. Conclusions are stated clearly and align with the argument, premise, and evidence.

Advocacy and refutation differ. Whereas advocacy is designed to enhance confidence in an idea, refutation is designed to undermine such confidence. As such, advocacy and refutation can be conceptualized as opposite sides of a persuasive debate, with advocacy involving a proponent who puts forward a set of ideas and refutation involving a respondent who rebuts the argument or points out logical weaknesses that undermine the validity of an idea.

Because advocacy and refutation are designed to persuade by taking a stance on an issue about which there may be varying opinions, interesting propositions suggest that prevailing beliefs about an issue or its normative appropriateness are, in fact, in error. Thus, with advocacy, interesting propositions argue that what is considered false is actually true, what is considered unacceptable is actually acceptable, what is considered wrong is right, and what is considered inappropriate is actually appropriate. Interesting propositions pertaining to refutation suggest the opposite.

Skill Building and Facilitating Tools

The conceptual contributions described in the previous section can form the basis for purely conceptual contributions. However, as noted, the conceptualization is pertinent to any paper that has a conceptual element, even if it is an empirical paper. For example, positioning a paper may involve identifying a new construct, relationship, or domain, providing a revised perspective on that entity, and/or articulating its significance and differentiating it from previously studied entities. Delineating constructs, domains, and/or relationships is critical to many papers that publish hypotheses or propositions. Advocacy is used to convince readers of the importance of a topic and why its study matters Refutation is used when rival hypotheses that may otherwise explain results are developed and then ruled out (see Platt 1964) Literature reviews and discussion sections entail summarization of what is known, while the development of hypotheses and the interpretation of data can involve integration of ideas into novel ones as well as the ability to advocate a particular position and refute others Thus, the skills involved in conceptual thinking should apply to most published papers, whether they are purely conceptual or conceptual–empirical blends

Given the central role of conceptualization in knowledge development, it is important to understand what skills these types of conceptual advances entail and how these skills may be fostered I turn to this issue next Figure 1 and the bottom two rows of Table 2 play an organizing role in the discussion that follows As this figure and table show, the eight thinking skills are not only similar and different in the ways previously mentioned, they also require similar and different thinking skills and facilitating tools [4]

Identifying and Revising

Skills Both identifying and revising involve divergent thinking skills, both of which are critical to creativity (see Figure 1) Creative thinking results from "originality of thought, having the ability or power to create or produce, having or showing imagination and artistic or intellectual inventiveness, stimulating the imagination and inventive powers" (Elder and Paul 2009, p 13) Both identifying and revising entail the ability to break free from an attachment to a familiar, comforting, prevailing frame of reference or worldview to see things that are not obvious (Zaltman, LeMasters, and Heffring 1985)

Yet they differ in other skills identified in Figure 1 Identification involves seeing something that has not yet been seen Thus, it requires a beginner's mind A beginner's mind can look at something as if seeing it for the first time and without inference or judgment However, revision involves understanding the prevailing view, which requires expertise in the entity under study Yet this expertise must be coupled with the creative capacity to see things anew and reconfigure the prevailing view in a different manner Thus, such a perspective requires both a beginner's mind and an expert's mind and the ability to articulate why the revised view offers improved understanding over the prevailing view (Li 1996)

Facilitating tools If identification and revision involve divergent thinking, how are divergent thinking skills fostered? An often-heralded method is the use of metaphors (see Thompson, Locander, and Pollio 1989) For example, Li (1996) describes how John von Neumann developed a new theory of mathematics and economic behavior (game theory) by thinking of decision making between two parties in terms of a game Morgan's (2006) classic book on organizations shows how the use of different metaphors for organizations (as machines, organisms, brains, cultures, political systems, psychic prisons, or instruments of domination) has yielded novel constructs and theories about organizations Thompson, Locander, and Pollio (1989) use metaphors in developing and articulating a revised perspective on science They compare the machine and container metaphors characteristic of logical positivism with a pattern and figure-ground metaphor that characterizes existential phenomenology

Identification and revision can also be fostered by questioning strongly held assumptions that may be at variance with the way the world actually operates Such is the case with Shugun's (1980) work on the cost of thinking and Holbrook and Hirschman's (1982) paper on experiential consumption Identification and revision can also be fostered by a search for anomalies, hidden events (Zaltman 1983), differences, and things that go against the trend as opposed to nonoutliers, things that are expected, similarities, and supportive findings

Additional devices may foster the open-mindedness necessary for identification Facilitating tools include "taking a hike" to adjacent disciplines, seeing new vantage points from which disciplines view related phenomena, and considering how their respective vantage points can fill blind spots in our field's understanding (Zaltman 2000) Thus, understanding a construct such as "brand relationships" can be facilitated by examining the study of human relationships in sociology and psychology, mechanical relationships (as in the study of magnets in physics), or principal–agent relationships in economics Introspection can facilitate identification because it allows a person to think about a new idea in terms of whether it "feels right " Immersion in an area of study can also provide insight, particularly if the researcher adopts a beginner's mind and observes without predetermined perspective, which, by definition, blocks the ability to see something new

Additional devices to foster revision include the use of heuristic devices, or previously identified bases for thinking about things For example, whereas early research on attitude formation processes considers consumers' motivation, ability, and opportunity to process ad information, the motivation, ability, and opportunity framework may also be a useful heuristic for thinking about other things, such as a salesperson's performance, consumers' abilities to delay gratification, factors that affect involvement in brand communities, and advertising executional cues (The latter is true of MacInnis, Moorman, and Jaworski's (1991) work Abbott (2004) identifies a set of different heuristics (beyond motivation, ability, and opportunity) that he used to provide revised perspectives on known phenomena

Delineating and Summarizing

Skills From a skills perspective, delineation and summarization require logical reasoning skills, defined as the ability to relate what is known in a linear, rational, internally consistent, and compelling manner (Elder and Paul 2009) Thus, they require the capacity to draw coherent conclusions on the basis of established findings Such reasoning may be expressed in the form of verbal arguments or mathematical arguments that lay out predictions based on mathematical criteria Halpern (1989) proposes that such reasoning uses knowledge about one or more related statements to determine whether another statement is logically true

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[4] The discussion emphasizes the dominant (not the only) set of skills aligned with each type of conceptual contribution

Notably, however, the two conceptualization types differ in other reasoning skills (see Figure 1 and Table 2) Delineation involves a process of deductive reasoning Such reasoning occurs when a person begins with a statement known or believed to be true and then uses this statement to make conclusions about something else A conclusion is valid if it necessarily follows from some statements called premises To illustrate, if it is known that A affects B and that B affects C, it can logically be deduced that A should also affect C through the mediational effect of B Deductive reasoning skills are useful in developing logical arguments on which hypotheses and propositions are based In contrast, summarization involves inductive reasoning Such reasoning begins with individual observations and then collates these observations into a higher-order set of conclusions Thus, if it is observed that consumers tend to make decision-making errors when they are in crowded stores, when there is music playing, or when their children are around, it might be induced that decision-making errors are caused by distraction, which interferes with information processing Because all three situations have distraction as a common feature, it becomes an overarching explanation that ties the individual observations together

Facilitating tools Because delineation involves charting, researchers have often benefited from a facilitating tool known as mapping (Novak 1998) A map is a visual representation of an area and its boundaries It is constructed in a manner that enables someone who has never traveled the route to understand how to get from point A to B Maps delineate where things are in relation to one another With mapping, entities are typically labeled with words and lines (or arrows) that are used to denote the relationship between one entity and other Frazier (1983, see Figure 1) provides an example of mapping a domain So, too, does Parasuraman et al 's (1985) theoretical model of the determinants of perceived service quality (see also Sherry 1983) With mapping, a person states what is known (I can get from point A to point B in 30 minutes, I usually travel at 60 miles an hour) and uses this knowledge to draw conclusions (A and B must be 30 miles apart)

When delineating theories, researchers might benefit from a "theories-in-use" approach (e g , Argyris and Schon 1974) Such an approach fosters theory development by understanding a phenomenon from the perspective of the self or someone who is experiencing it This tool also involves immersion in a phenomenon and uses immersion to understand relationships Zaltman, LeMasters, and Heffring (1985) illustrate this approach through the example of a salesperson who views his or her role as that of a consultant (as opposed to being an advocate) for a good being sold This consultant perspective allows the theorist to develop novel propositions by listening to or thinking through if/then logic "If I appear to be concerned with understanding the consumer's problem, and if I offer general advice about solving that problem, then the consumer will perceive me to be on his or her side and thus relatively more objective, and hence is more likely to accept suggestions I make " From there, logical propositions can be deduced (e g , "The more oriented a salesperson is to understanding consumers' problems, the more likely it is that the consumer will accept his or her advice The more the salesperson displays a consulting role [as opposed to an advocacy role], the more likely it is that the consumer will accept his or her advice" (Zaltman, LeMasters and Heffring 1985, p 115) Zaltman, LeMasters, and Heffring recommend that a theories-in-use approach should also include unsuccessful practices Such unsuccessful practices are useful for charting boundary conditions under which the theory may or may not hold

Mapping is also useful for summarization, though maps can show the underlying features or properties that connect specific instances to a higher-order entity For example, an "organizational chart"-type map might be used to suggest that "distraction" is the higher-order construct that connects crowds, music, and children with reduced information processing Summarization is also facilitated by outlines, which use devices such as headings and subheadings to organize materials into categories that relate studies to one another (see Folkes 1988, for examples of useful headings, Gardner 1985) Boxes in maps represent major headings in an outline, which in turn organize prior research in a way that allows for synthesis Subheadings further organize what is known, with research organized into headings that support a given linkage, others that do not support it, and still others that identify contingent factors

Differentiating and Integrating

Skills Various skills related to differentiating and integrating can also be identified Contributions based on differentiation and integration are similar Both involve comparative reasoning skills, which involve the act of examining resemblances based on similarities and differences However, differentiation requires analytical reasoning skills, defined as the capacity to see the details of something and to characterize them in terms of its elements or constituent parts (Elder and Paul 2009) For example, the construct of hope can be decomposed into its constituent appraisals That is, a person feels hope when an outcome is appraised as desirable, as consistent with that person's goals, and as uncertain but possible Differentiation makes it possible to see how hope differs from potentially related constructs Wishing is similar to hope, but whereas hope is related to future outcomes believed to be possible, wishing is often related to outcomes that are desirable but impossible By distinguishing the essential elements or properties underlying hope, it is possible to understand how it is similar to and different from other constructs In contrast, integration involves analogical thinking, which is defined as the ability to think of something in terms of something else Integration also requires the expertise characteristic of revision because understanding similarities and differences requires prior knowledge It also requires imagination—a characteristic linked to identification

Facilitating tools Several tactics foster the comparative reasoning skills associated with differentiating and integrating (see Marzano, Pickering, and Pollock 2004) Assessing similarities and differences is fostered by exercises that ask for comparisons of similarities and differences Such exercises may be accompanied by graphic devices, such as Venn diagrams, in which similarities are represented by the intersections of circles and differences are represented in nonoverlapping areas Comparison matrices are other graphic devices in which people develop a grid with items to be compared along the matrix columns and characteristics linked to the items in the matrix rows The goal is to identify features, characteristics, or dimensions along which the items can be compared and then to indicate whether these comparisons reflect similarities or differences (see, e g , Calder, Phillips, and Tybout 1981)

The development of integrative thinking skills is particularly challenging, research indicates that people who are skilled at integrative thinking cannot articulate how they developed their integrated ideas (Dixon 2005) However, it is possible that the ability to think analogically can be fostered by training in solving analogies (e g , book is to human as _____ is to bear) or thinking metaphorically For example, at least three theories have been proposed to explain consumer satisfaction expectancy disconfirmation, equity theory, and attribution theory In developing an integrative theory, perhaps analogies can be drawn between the theories (e g , expectation is to product as fairness is to person) By examining what aspects of one theory do and do not map onto aspects of other theories, a novel metaphor might be uncovered that accommodates both the elements on which the theories are comparable and those on which the theories are not comparable

Advocacy and Refutation

Skills Both advocacy and refutation involve syllogistic reasoning, which involves deciding whether a conclusion can be inferred from one or more premises (Halpern 1989, p 128) With advocacy, the researcher attempts to provide undisputed premises from which a conclusion logically follows With refutation, the researcher disputes the premises and/or shows that the conclusion does not follow logically from them Notably, a single researcher can engage in advocacy and refutation with respect to his or her own ideas, first advocating an idea and then being critical of the persuasive logic Elder and Paul (2009) call this process "dialectical reasoning "

Refutation and advocacy differ, however, in the necessity of critical reasoning skills, defined as skills of careful judgment, reflection, or observation aimed at questioning, finding fault with, and determining the merit or accuracy of a conclusion and/or its premises (Elder and Paul 2009) Such critical reasoning skills are an essential component of refutation

Facilitating tools The facilitating tools linked to advocacy and refutation are similar, as Table 2 shows However, their application differs as researchers use these tools in an advocacy form to argue for what is true or should be believed or followed With refutation, these tools are used to dispute or argue against a view or suggest what should not be believed Walton (2006, see also Walton, Reed, and Macagno 2008) suggests that evaluating the plausibility of persuasive arguments can be fostered by argument diagrams With argument diagrams, verbal arguments are translated into a set of diagrams that visually depict the premises and the conclusions derived from them This diagramming makes the premises and conclusions explicit, making it easier for the evaluator to determine whether they are defensible

Researchers can also be trained to identify argumentation schemes, which are various types of plausible arguments whose validity can be assessed by a set of questions A common argument scheme is to appeal to an expert For example, "Jones is an expert in marketing relationships Jones claims that power imbalances between two parties will undermine the relationship's tenure Therefore, power imbalances do indeed undermine a relationship's tenure " When the scheme is identified, a set of questions can be asked that help validate the plausibility of this conclusion With such appeals to expert schemes, a researcher can ask (1) Is Jones indeed a credible expert? (2) Is Jones an expert in the area of marketing relationships? (3) Is Jones's assertion based on solid evidence? and (4) Is the conclusion consistent with what other experts would say? Walton (2006) identifies a set of other argument schemes and associated questions Such schemes include arguments based on popular opinions, arguments based on analogy, arguments that use correlation to assume causation, and arguments based on purported consequences, among others In each case, the goal is to articulate a set of questions designed to help assess whether the premise and the conclusions drawn from it are valid

Advocacy and refutation can also be based on known persuasion tactics, the awareness of which can facilitate refutation For example, researchers can be trained to check for fallacies, such as the use of false dichotomies, circular reasoning, the provision of irrelevant reasons, the use of weak or inappropriate analogies, the use of emotional (suggestive or propaganda-like) language, the use of appeals, tradition, oversimplification, and incomplete or erroneous comparisons, among others Gula (2007) provides excellent examples of these reasoning fallacies

Moving Forward

I conclude with a set of recommendations for moving our field forward in making future conceptual advances These recommendations are clustered into four categories (1) valuing conceptualization, (2) addressing shortages, (3) developing/sustaining a beginner's mind, and (4) fostering training in conceptual skill development

Valuing Conceptualization

Conceptualization is critical to vitality of academic fields—whether it is manifest in purely conceptual papers or in conceptual–empirical blends Yet our field seems to have swung in the direction of valuing the empirical over the conceptual (e g , Kerin 1996, Stewart and Zinkhan 2006, Webster 2005, Zaltman, LeMasters, and Heffring 1985)

This movement is evident not only in the decline in purely conceptual papers in our field's top journals but also in the fact that empirical advances (in methods, statistics) and empirically focused PhD coursework have outpaced conceptual advances and courses Empirical methods are essential, but unless they are accompanied by good and interesting ideas, their value diminishes

Moreover, whereas all articles (empirical and conceptual) are essential to the advancement of the field, conceptual articles play a special role by addressing big issues for which an accompanying empirical component may be impossible, particularly in the space of an academic journal article Such papers are more likely to have an impact in both their influence on other's work and the external recognition they receive (Yadav 2010) The precipitous decline of such articles suggests that the field may be missing important ideas

It might be argued that our field *is* open to conceptual papers, but their exposition is best suited to books (versus journal articles) Indeed, some of the most highly cited works in marketing and consumer behavior have appeared in books (e g , Bettman 1979, Howard and Sheth 1969) Yet books are no longer valued in promotion and tenure decisions, giving authors little incentive to write them Moreover, many of the most provocative conceptual pieces that appear in books today come from the practitioner community This outcome undermines the credibility of the academic community, which in turn can taint our reputation as thought leaders

It might also be suggested that the field *is* open to conceptual papers by pointing to articles (AMA Task Force 1988, Yadav 2010) and editorials (e g , Kohli 2009, Monroe 1993) that acknowledge their importance Indeed, some of the field's most respected and influential thought leaders express this view Yet these calls remain largely unheeded Why? Maybe we lack of a framework for thinking about conceptualization The articulation of such a framework has been the goal of this paper However, perhaps our field has an empirical bias that disinclines reviewers to accept such papers (which in turn disinclines authors to write them) This state of affairs would be unfortunate An astounding number of fundamental and interesting constructs, theories, domains, and procedures were introduced to the marketing field from 1952 to 1977 (see Wilkie and Moore 2003, Table 5) because openness to thinking conceptually was deemed important

This openness needs to be recaptured Editors play a central role in directing this openness They should be explicit (as is Kohli 2009) in communicating their receptivity to conceptual papers Editorials, meet-the-editor sessions, and editorial review board meetings should be opportunities to discuss their stance on such papers Yet editors alone do not bear the responsibility of driving the direction of the field Reviewers should be sufficiently open-minded to accept articles based *not* on the nature of their execution (i e , whether they are empirical or conceptual) but rather on the rigor and quality of their ideas Finally, authors should be emboldened to write conceptual papers In addition to writing papers that emphasize incremental findings (e g , understanding moderators and mediators of a known relationship), authors should assume responsibility for addressing interesting and novel domains, theories, constructs, and procedures that will augment the field's vitality

Attending to and Addressing Shortages

My "armchair review" of the conceptual articles published in the field's top journals over the past 25 years reveals a preponderance of articles that emphasize differentiation and delineation Summarization papers are increasingly rare and are often relegated to specialized journals or book chapters Furthermore, current standards seem to demand that summarization-type articles be complemented by empirical validation, as is true with meta-analysis Meta-analysis is an extremely valuable procedure Yet not all entities have a sufficient level of development or comparability to make for a useful meta-analysis Meta-analysis may be most relevant to well-entrenched research domains in which researchers have examined similar phenomena that vary in context and procedures They may be less useful for understanding an entity for which research is emergent, yet not yet entrenched

Relatedly, although we do have articles that are called "integrative reviews," many (including my own) are summarization (not integration) papers True integration papers are rare Perhaps this is because they require a full set of conceptual thinking skills In addition to expertise and a beginner's mind, they require the ability to see differences, the ability to think inductively about how various perspectives are related, the ability to take a creative stance on the entity, the ability to use deductive reasoning to put forth new arguments, and the ability to do so persuasively Perhaps some forms of integration may be most successful when accompanied by structural models that test an integrative perspective (e g , MacKenzie, Lutz, and Belch 1986) Nonetheless, the value of integration cannot be underestimated Consider, for example, the incredible productivity engendered by the elaboration likelihood model of persuasion, which is a truly integrative perspective on attitude formation processes

Debate exists, but with the exception of the recent "Dialogues" sections in *Journal of Consumer Psychology*, it is rare Indeed, some journals discourage debate by having a policy that excludes rejoinders Perhaps debate is discouraged because it is perceived as instilling ill will among researchers and fragmenting a research community Furthermore, authors may consider debate risky Those who attempt to refute the ideas of other authors may find their own work rejected by these same individuals Perhaps debate is less prevalent in marketing than in other disciplines because debate in other disciplines often centers on theories, in marketing, we have been less adept at developing, proposing, and debating theories than in borrowing theories developed elsewhere To the extent that we borrow a theory, we do not spend time debating its validity

Relatively few purely conceptual papers emphasize new constructs or theories Perhaps new constructs and theories are more likely to appear in empirical than in purely conceptual papers However, I fear that our discipline lacks a sufficient emphasis on developing new constructs and theories (see also Stewart and Zinkhan 2006). Empirical papers that emphasize new relationships seem to study "effects" (e.g., relationships between variables). Even if they include moderators that identify contingencies for the effects or mediators that specify the process by which effects are observed, they often stop short of using these observations to build novel theory.

Identifying shortages is important because all types of conceptualizations add value. To the extent that our field emphasizes one type of thinking over another, knowledge in the field may be stunted. Indeed, the eight types of contributions noted in Figure 1 might be characterized as reflecting the process by which knowledge of an entity evolves. Knowledge begins when something new is first identified. Research advances by efforts to delineate it. Through delineation, complexities are realized that, in turn, require differentiation, which ensues from deeper thinking. Clarity from differentiation gives way to agreed-on views that are advocated and seem true. Subsequent thought may give way to a revised perspective, with summarized views on the revised view giving way to integrated perspectives. Refutations of the integrated view give rise to the identification of novel ideas. In this view, the eight conceptual contributions reflect the evolution of conceptual ideas about the entities in Table 1 from their early identification to more complete perspectives on them. Thus, the eight types of conceptual skills capture the development of knowledge and ultimately reflect the engine of scientific progress. As such, attentiveness to the underrepresentation of certain types of conceptualizations and their bases is important.

Developing and Sustaining a Beginner's Mind

Big areas of research begin with the process of identification. Indeed, it might be argued that identification is the most important of the conceptualization types. Yet our field does little to support the beginner's mind that is conducive to identification. In fact, it seems to dampen it. The people who are perhaps most adept at identification are first-year PhD students. Yet, they are immediately "indoctrinated" to learn a prevailing paradigm. Thus, they are trained as "game theorists," "information processing researchers," or "transaction cost analysis researchers" according to their advisor's interests and expertise. Such training may suggest that prevailing views are "right," silencing new ways of thinking. Among more experienced academics, indoctrination creates levels of comfort, which may minimize identification by disinclining the researcher to movement outside his or her comfort zone. Moreover, instead of developing a beginner's mind, researchers often immerse themselves in the academic literature for sources of inspiration. Turning to the literature is useful, but it can stymie identification by inclining us to understand something in terms of established ideas.

A critical avenue for cultivating a beginner's mind stems from immersion in the phenomenon of interest. Interesting new insights can come from observing managers, consumers, and retailers and from understanding their day-to-day realities. For example, a student doing a dissertation on social media may uncover new ideas from reading blogs, following people on Twitter, and reading posts of reviewed products. Immersion in the phenomenon encourages those with strong conceptual thinking skills to identify what others have not yet discovered. Yet immersion is rarely encouraged, except among scholars who adhere to the consumer culture theory paradigm. We need to support a beginner's mind. Supporting a beginner's mind through immersion can further enhance the impact of marketing scholars on the managerially, socially, and politically significant issues that face consumers and marketers alike. To the extent that we deeply understand the phenomena we study, we may have more credibility with external constituents (e.g., the press, managers, policy makers, students).

Training in Conceptual Thinking Skills

Finally, it strikes me that conceptualization and its attendant thinking skills are not emphasized in doctoral training. Instead, the importance of conceptualization and knowledge of conceptual thinking skills is often tacit, making it possible and even likely that gaps in conceptual thinking arise. This is unfortunate because conceptual thinking skills are critical to all scholarly works—even those that blend conceptual ideas and empirical data. It is also unfortunate because literature pertaining to these thinking skills is both extensive and eminently teachable. For example, outside marketing, it is relatively easy to find work that describes skill development related to persuasion and logical thinking skills (e.g., Walton, Reed, and Macagno 2008), induction (Holland et al. 1987), and deduction (Bonevac 2003), among others. We should offer students a language for these conceptual thinking skills and provide guidelines for how such skills might be developed. It is my hope that this article, and the typology it describes, provides a starting point for making these ideas explicit, in turn making contributions a priority for the next generation of marketing scholars.

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Donald R. Lehmann, Leigh McAlister, & Richard Staelin

Sophistication in Research in Marketing

Over the years, the level of analytical rigor has risen in articles published in marketing academic journals While, ceteris paribus, rigor is desirable, there is a growing sense that rigor has become a, if not the, goal for research in marketing Consequently, other desirable characteristics, such as relevance, communicability, and simplicity, have been downplayed, to the detriment of the field of marketing The authors explore this imbalance, setting forth the consequences of overemphasis on rigor for (1) the manuscript review process, (2) PhD programs, (3) hiring, and (4) the tenure and promotion review process Two surveys of "successful" authors provide empirical support for the conjectures put forth The authors then identify the causes for this trend and propose some directions to reestablish a better balance between rigor and relevance

Keywords priorities, communication, relevance, rigor

Marketing, almost by definition, is an applied field of inquiry Moreover, it is boundary spanning in that it interfaces with almost every aspect of the firm Consequently, research in marketing should be broad in nature and strive to yield insights that potentially help us better understand the consequences of marketing actions and improve the practice of marketing Of course, it is also important to ensure that the findings of any research are not incorrect because of faulty research procedures The tension between making sure our field provides insights that are relevant and accessible and the quest to make sure that the insights are not incorrect as a result of faulty analysis has been present for at least 50 years However, recently there has been a noticeably increased emphasis on the use of (often unnecessarily) complex analyses and an accompanying decrease in emphasis on the importance of the topics explored and the substantive insights that come from these explorations This analytical complexity has one clear downside It hinders communication, making any insights associated with the research less accessible to managers as well as to most other academics Another consequence of increased complexity is that marketing scholars are partitioning themselves into small groups, in which each group is defined by the particular kind of complexity that group favors, leading to fragmentation of the field We attribute this fragmentation partly to the fact that only a small subset of scholars feels competent to evaluate (or understand) a particular researcher's theory, methods, and findings and partly because scholars have concluded that being more technically sophisticated increases their probability of being "successful" academics This growing complexity of research and fragmentation of the field increases the likelihood that any given piece of academic research in marketing speaks only to a limited set of marketing academics It also implies that the research is less likely to examine issues that span boundaries As a result, academic research in marketing has less impact on both the practice of marketing and overall knowledge development Importantly, as the field of marketing focuses more attention on rigor, other disciplines are addressing substantively important topics that are inherently concerned with either marketing functions (e g , supply chains, service quality, pricing, new types of communications) or broad topics related to complex interactions within the firm and between the firm and customers and competitors[1] The net effect of all this is that our field is becoming increasingly marginalized

This article considers some of the forces driving the field of marketing toward complexity at the expense of relevance The tendency to make rigor a goal unto itself during the review process has implications for the types of papers that are published, the type of education provided to PhD students, and the type of marketing faculty being hired and promoted by major business schools The changes in PhD programs and marketing faculties, in turn, increase the level of complexity expected in academic research in marketing, resulting in self-reinforcing feedback loops We examine the implications of this complex feedback loop for different stakeholders within the marketing field and provide suggestions of ways to rebalance the trade-off between needed rigor and the quest for relevance

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[1] For example, *Management Science* recently had a call for papers that examine marketing's various interfaces with other disciplines More than 150 papers were submitted, a figure that exceeded the annual submission to the department of Marketing within *Management Science* Moreover, the department exhibited no decrease in normal submissions, implying almost no cannibalization of normal marketing topics

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The "System" Behind Publications

The phenomenon we discuss has come about because of a variety of interrelated causes, including faculty hiring sources, PhD program input and training, promotion and tenure decisions and processes, and the review process Figure 1 summarizes a "model" of the system Two aspects of the model deserve special attention First, while there is some temporal ordering of the different causes and effects, almost all the major components of our system have feedback loops (indicated by dashed lines in Figure 1) For example, the outcome of the review process in terms of published papers affects faculty perceptions of what is needed, "correct," and valued and, thus, the papers they subsequently produce and submit

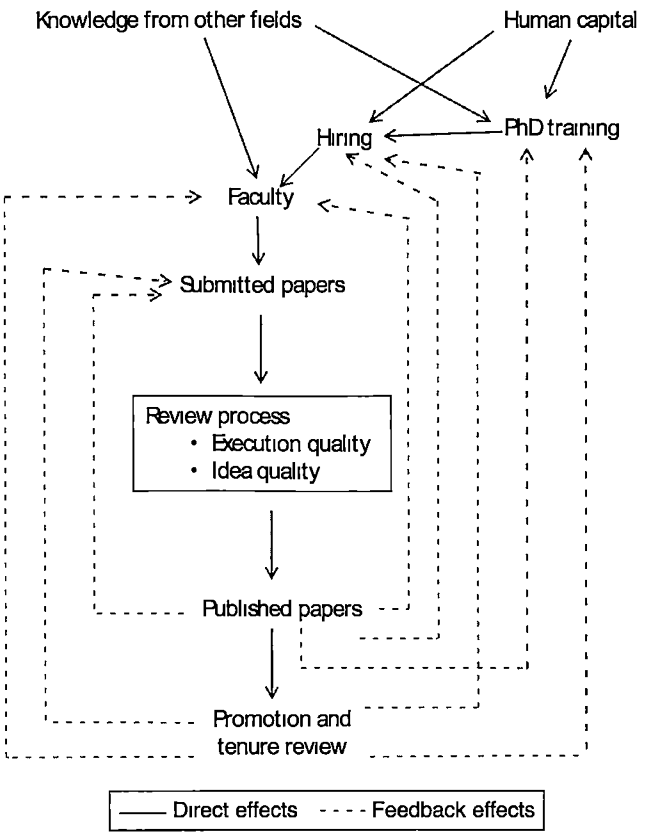
Second, the review process plays a central role in the system Other components either directly or indirectly drive both the type of papers that are submitted through the selection and the training of faculty, most notably through PhD programs, or are driven by the outcome of the review process (i e , what gets published) and subsequent tenure and promotion decisions In terms of feedback, faculty members observe what is published (which they interpret as the equivalent of best practices) and the outcome of promotion and tenure decisions and accordingly modify their work and sense of what constitutes good research Therefore, the overall system tends to move in a particular direction as the various players make decisions that reinforce the current direction, much in the way an informational cascade (Bikhchandani, Hirshleifer, and Welch 1992) works In what follows, we describe in more detail the behavior of key components of the system, with a particular emphasis on the review process

The Sources of Faculty

We begin our discussion on the trade-off between rigor and relevance by noting that there have been significant changes in our field over the past 50 years Major changes were triggered when both the Ford Foundation and the Carnegie Foundation sponsored studies in the early 1960s, which concluded that business training needed to become more analytical (for a more complete discussion of these events, see Danneels and Lilien 1998, Wilkie and Moore 2003) In response to this observation and to shift the focus of MBA education toward making decisions based on careful (often quantitative) analysis, the field began to draw more heavily on underlying disciplines, such as economics, statistics, operations research, psychology, and sociology As a result, marketing began to import scholars trained in other disciplines' methods and to shift marketing PhD training from primarily business-related courses to courses in the basic disciplines This radically altered academic marketing research, which had previously been largely descriptive

Interestingly, while scholars from the basic disciplines have continued to migrate into marketing, this migration has subtly changed over the years In the initial migration, most new entrants not only addressed marketing-related issues but also attached their identity to the field of marketing More recently, however, many scholars in marketing departments are (or would intellectually like to be) more strongly affiliated with a discipline other than marketing In addition, there is a belief among many faculty members that the basic disciplines are more rigorous and "sophisticated" as well as prestigious and thus possess characteristics that should be emulated Consequently, young scholars (and reviewers) tend to employ the most recent (and complex) methods and standards popular in specialized areas (in effect engaging in a technical sophistication arms race), which in many cases are not needed or helpful in understanding relevant marketing phenomena

FIGURE 1
The Research System and Feedback Loops



These changes have led marketing departments to place more emphasis on hiring technically competent faculty Such hiring strategies are not irrational or entirely undesirable, insofar as marketing is constantly evolving and new theories and methods have played a major role in its advancement However, the net effect is that each new crop of faculty hires tends to have successively more technical sophistication but less understanding of, and appreciation for, the range of important marketing problems As these newly minted faculty members join the army of reviewers in our field, they naturally accelerate the shift Ellison (2002) identifies in moving the reviewing criteria away from idea quality and toward methodological sophistication Thus, the desire to acquire additional sophistication has the unintended consequence of ultimately affecting the review process and, consequently, what is published

Journal Proliferation

The migration of scholars from the basic disciplines and the resultant incorporation of these disciplines' ideas and concepts in marketing is not the only major change in our field that has led to more emphasis on execution and fragmentation of ideas and problems addressed. From a single journal in 1925 (*Journal of Retailing*), the academic marketing outlets for new ideas expanded fairly modestly to four by 1964 (adding *Journal of Marketing*, *Journal of Advertising Research*, and *Journal of Marketing Research*) and six by 1974 (adding *Journal of Advertising* and *Journal of Consumer Research*). Since then, the number of journals has exploded (for a more complete listing, see Lehmann 2005) and continues to expand. This has encouraged specialization of topics, methods, and language, in effect both recognizing and encouraging a splintering of marketing academics. The net result is that authors are talking to a smaller and smaller subset of scholars who have a common interest in a relatively small set of well-defined problems as well as a common research paradigm and language. The increasing rigidity (if not isolation) of these ever-narrowing domains contributes to the field's move away from big, boundary spanning ideas and toward specialized methodology.

The Review Process

All these changes have greatly affected the manuscript review process. We discuss the review process in some detail because it plays a pivotal role in what is ultimately published and thus ultimately affects what the field views as "successful" academics and research. In addressing this topic, we acknowledge that we are not the first to discuss these issues, nor is this discussion unique to marketing. For example, discussions about the review process have also appeared in the economics (Ellison 2002) and accounting (Swanson 2004) literatures.

We begin with a discussion of Ellison's (2002) model, in which he posits that reviewers continually try to deduce the current social norm for evaluating overall quality. He argues that the evaluation process naturally shifts toward an overweighting of the execution quality relative to the idea quality (importance and interest of its main ideas). He attributes this to the idea that reviewers overrate the execution quality of their own research and, therefore, based on the reviews they receive of their own work, come to believe that the importance (as viewed by the field) of execution quality is greater than they initially thought. The cycle repeats itself, with the end result being that what Ellison calls "r" quality (executional rigor) dominating "q" quality (relevance and interest). Ellison goes on to argue that this tendency to overemphasize executional rigor also results from reviewers trying to impress the editor by requiring complex revisions and sometimes even imposing executional quality standards above the norm to hold others back.

These changes in the review process have also been discussed in the marketing literature. McAlister (2005) draws attention to the relevance of Ellison's (2002) model for the evolution of the field of marketing. Yadav (2010) documents the shift of *Journal of Marketing* away from conceptual articles, and Reibstein, Day, and Wind (2009, pp. 1–2) lay out the implications of marketing's shift in reviewing criteria from idea quality to methodology:

> The prevailing research paradigm in most parts of marketing academia is to begin with a new methodology, data set, or a behavioral hypothesis and only then occasionally ask where it might be applied. This reduces the odds of addressing a pressing marketing issue. The resultant conclusions are of some relevance to other researchers, but they offer little guidance for marketing decision making.

Reibstein, Day, and Wind call for a change in the academic marketing research process. In particular, they suggest "that a better approach is to begin with an important problem and bring to it the best combination of methodology, data and theory" (pp. 1–2). This largely reprises the thesis of Lodish (1986), who asks the rhetorical question whether it is better to be vaguely right or precisely wrong.

The shift in reviewing emphasis has had a particularly negative impact on two types of papers. The first are papers that break genuinely new conceptual ground. Such papers are likely to be criticized for their lack of theory. This criticism takes the somewhat absurd position that the new theory must be justified by old theory. Reviewers (and editors) often do not seem to recognize that if theory is new, it often cannot be justified by old theory; rather, new theory may well contradict old theory. (How could Einstein have justified $E = mc^2$ based on Newton's $F = ma$?) Instead, the operational definition of good execution in terms of theory is a paper that includes a long section describing what others have already published, some of which is typically (1) already widely accepted and (2) obvious. Indeed, a better measure of the potential of a paper to make major new contributions to theory may be the *lack* of references to prior work—in other words, the work stands on its own.

The second type of paper that has been adversely affected is one that presents purely empirical (but interesting) results—that is, new and interesting stylized facts—but is largely devoid of theory. In such cases, the reason often given for rejection is that the paper is not "sophisticated" because it does not test a preexisting theory. Yet Brahe's careful measurements (empirical facts) were the basis for his student Kepler's laws (a new theory). Likewise, the initial work on the mere measurement effect (Fitzsimons and Morwitz 1996) was basically a set of new stylized facts that spawned a stream of research aimed at better understanding why this effect occurred. Another example of a new and interesting stylized fact is the work of Blattberg and Wisniewski (1989), who point out the empirical regularity that promotion of top-tier brands strongly affects lower-tier brands, but in general the converse effect is not observed. This observation has led to others trying to understand why this occurs. Finally, we note in passing that much has been said about whether theory or data come first (i.e., is it ETET or TETE?); see, for example, the discussions of Bass (1995) and Ehrenberg (1995). A more pragmatic and useful view is that it does not matter which comes first, only that each type contributes to future work. This strongly suggests that both types of papers should be valued by our profession and are equally important to the advancement of knowledge. A corollary to this is that it is not clear that requiring all papers to be strong on theory and empirical results (or on analytical rigor and substantive content) is the best way to advance the field.

A common example of reviewers' overemphasis on the execution quality of a paper is a formulaic adherence to what constitutes "good" research. Take, for example, the "bias" against construct measurement based on only one or two items. Clearly, measurement based on only a few fallible measures has limitations, but it also has benefits. For example, respondent burden is reduced. Furthermore, there is diminishing value in reducing random error through averaging multiple items (which often are merely slight restatements of each other). Formulaic rules such as "you need a minimum of three items per construct" ignore reality. Some constructs can be adequately captured with just one question (e.g., attitude toward ads and brands, Bergkvist and Rossiter 2007), while attitudes toward tenure, war, and so on may be nuanced and multifaceted and may require far more than three items, or even dimensions, to capture them. Other examples are the "rules" that one must (1) use structural equation modeling versus regression when analyzing survey data, (2) run at least three experiments, (3) have interaction effects in addition to main effects, and (4) always have longitudinal data if you want to overcome common method bias. These rules confuse desirability with hard and fast requirements.

How Successful Authors View the Review Process

We wondered if there is a consensus supporting our conjecture that the review process is slanting the field's research away from big ideas and toward execution. (One hypothesis is that our views are in the minority and that most marketing academics feel the field is moving in the right direction.) Therefore, we broadened our inquiry by sampling "successful" authors, specifically those researchers who had published in *Journal of Marketing* (*JM*), *Journal of Marketing Research* (*JMR*), *Journal of Consumer Research* (*JCR*), or *Marketing Science* between January 2005 and January 2009. (For better or worse, many in the field refer to these as the top four "A" journals in marketing.) We selected this group of authors because we believed that they would be more likely to have a positive view of the review process, given that they received at least one favorable review outcome. Moreover, they are also likely to be reviewers for those journals and thus part of the "system." We sent e-mails to every author who met this criterion for whom we could obtain an e-mail address. This resulted in a list of 510 authors, of whom 286 completed our survey, for a response rate of 56%. The respondents represented a broad cross-section of the field, with 22% being in the field for 5 or fewer years, 23% for 6–10 years, 26% for 11–20 years, and 24% for 21 or more years (6% of respondents did not respond to this question).

Using the critical incident method, we asked respondents to evaluate two recent reviews, one that they would classify as "useful" and another they would classify as "not useful." Respondents then reported on the nature of requests made for both types of reviews. As we report in Table 1, three kinds of requests were more likely to be associated with "useful" (vs. "not useful") reviews: enhance managerial relevance, provide a stronger theoretical justification, and defeat (rule out) an alternative explanation. Three kinds of requests were more likely to be associated with "not useful" (vs. "useful") reviews: use a different model, use a more complex method, and alter the thrust of the paper. The other two types of requests often mentioned were to extend the exploration to other areas (19%) and collect new data (46%). These were equally likely to be requested in helpful and unhelpful reviews. Thus, it appears that authors perceive reviews as "useful" if the requests focus attention more on the quality of the research question versus the methodology used in the paper. In contrast, authors are more likely to perceive reviews as "not useful" when the review team is concerned with the execution of the research and/or tries to "rewrite" the paper by altering the thrust of the author's intended exploration. The impact of these different requests is also of interest. When those researchers who were asked to use a more complex method or a different model were asked whether their conclusions were altered by the increased complexity, more than 80% indicated that the conclusions did not change; only 19% of the time did these authors report that the more complex analysis gave the reader (or them) new insights. In contrast, they reported the paper became more difficult to read as a consequence of this new analysis 38% of the time. In addi-

TABLE 1
Characteristics of Useful and Not Useful Reviews

	% Indicating That They Received This Request in the "Useful" Review = USEFUL	% Indicating That They Received This Request in the "Not Useful" Review = NOT USEFUL	Index = USEFUL/ NOT USEFUL
Reviewer Request Associated with "Useful" Review			
Enhance managerial relevance	33%	14%	2.36
Provide stronger theoretical justification	60	39	1.54
Defeat an alternative explanation	48	36	1.33
Reviewer Request Associated with "Not Useful" Review			
Use a different model/use a more complex method	30%	48%	.63
Alter the thrust of the paper	27	46	.59

tion, almost 49% indicated that they received a request to provide more complex analyses at least 50% of the time over the past five years, while only 22% indicated they had never received such a request In contrast, when the authors were talking about useful reviews, 45% of those who were asked to increase the managerial relevance indicated that this resulted in new insights, and 41% indicated it improved the focus of the paper We take this as additional evidence that our field believes the review process is overemphasizing complexity because, in general, successful authors receiving these reviews do not believe such requests enhance the paper (We can only imagine the reactions of unsuccessful authors)

A separate study of 212 authors who had published in *Marketing Science* during the past ten years further addressed these issues Specifically, it asked the two following questions (1) "One comment often heard is that the review team is too 'involved' in the review process and asks the author(s) to rewrite the paper in a different direction than the initial submission Do you think this happens at *Marketing Science*?" and (2) "Another comment heard is that the review team asks the author(s) for more complex analysis/models even though such analysis/models are not necessarily needed Do you think this occurs at *Marketing Science*?" Approximately 80% of respondents indicated that both requests occurred most or all of the time [2] They were also asked that if such requests occurred, should the editor step in and say that these requests are not the prerogative of the review team Approximately 80% agreed the editor should take such an action (We return to this recommended editor action later in this essay)

Because the four journals we focused on differ in focus, we analyzed the respondents' reactions by journal The results (Table 2) are noteworthy While there is a clear endogeneity issue here (i e , authors select journals partly on the basis of the type of reviews they expect to get), the journals indeed have different profiles

The first row of Table 2 indicates that, for approximately 20% of the respondents, *JM* is the journal they read most and in which they publish most often (and incidentally is the most highly cited of the four), while *JCR* accounted for 40% of the respondents The other two journals each accounted for approximately 20% (The remaining 3% of the respondents indicated that their preferred journal was not one of the four listed journals) The second row shows that the four studied journals attract similar mixes of new and seasoned authors, with the length of time our respondents have submitting papers to these journals being approximately 12 years The next six rows of Table 2 summarize authors' evaluations of the journal that they publish in or read most frequently While all authors report that the journal's published articles tend to use overly complex statistical methods, are often written too technically, and use too academic a tone, *JMR* and *Marketing Science* tend to be especially high on those dimensions Despite this, 65% of the authors report that their papers improved as a result of the review process most of the time, and 43% report the review process was satisfactory most of the time This sug-

TABLE 2
Authors' Evaluations of the Journal in Which They Publish Most

Measures	***JMR***	***JCR***	***JM***	***Marketing Science***
% of authors reporting this journal as the one which they publish in or read most frequently	16%	40%	20%	21%
Authors' length of time in field (1 = "2 or fewer years," and 5 = "more than 20 years")	3 52	3 48	3 48	3 67
Papers in This Journal				
Emphasis on theory (1 = "too little," and 5 = "too great")	2 86	3 39	2 84	2 80
Use of statistical methods (1 = "too elementary," and 5 = "too complex")	3 52	2 98	3 30	3 72
Writing (1 = "too elementary," and 5 = "too technical")	3 48	3 18	3 14	3 59
Tone (1 = "too practical," and 5 = "too academic")	3 48	3 18	3 14	3 59
My papers were improved by reviews (1 = "never," and 5 = "always")	3 45	3 62	3 86	3 63
The review process was satisfactory (1 = "never," and 5 = "always")	3 29	3 20	3 50	3 43
% of authors reporting this journal to have provided the "useful" review they evaluated	29%	26%	26%	12%
% of authors reporting this journal to have provided the "not useful" review they evaluated	27%	30%	12%	19%

Notes Based on N = 249 advertisements Attention duration for the advertisement as a whole is not the exact sum of attention to the separate ad elements, because attention to overlapping ad elements is assigned to both Raw JPEG file size is shown, log-file size is used in the analyses gests the review process needs revision, but not necessarily a complete overhaul.

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[2] Exact responses were as follows Does *Marketing Science* ask authors to rewrite the paper in a different direction? 18% of respondents answered "all of the time," and 60% answered "most of the time " Does *Marketing Science* ask for more complex analyses? 29% of respondents answered "all of the time," and 45% answered "most of the time "

To examine whether expressed concerns with the review process differed by years in the field (in particular, to determine whether the concerns were more strongly expressed by senior colleagues), we analyzed the responses using "time in the field" dummy variables (representing four cohorts: in the field 5 or fewer years, 6–10 years, 10–20 years, and more than 20 years). For most of the items in the survey, there were no significant effects for different cohorts. Thus, the concerns appear to be general. However, there were two questions for which there were cohort differences. The newest cohort (in the field 5 or fewer years) reported lower levels than other respondents for "more complex analyses were required" and "the frequency with which reviewers made conflicting requests." Receiving fewer requests for more complex analysis is consistent with the newest faculty in the field, who prefer more complex methods. Perhaps younger scholars get fewer conflicting requests because their papers are more focused and thus there are fewer directions/problems that the review team might comment on or because new faculty using these more complex approaches tend to draw reviewers who not only can evaluate but also share in their preference for the new approaches.

We also examined the open-ended comments respondents made (for a sample of such comments, see the Appendix). While this analysis is less formal, many of the responses reinforce the conclusions based on the structured questions. Importantly, none of the responses indicated that the field lacked technical sophistication or that the executional quality of the papers published in marketing was inadequate.

Another way to assess the relative weight that should be placed on different aspects of a paper is to consider how the field ultimately evaluates published papers. We did this by examining the papers that won one of the 40 major research paper awards from *JM*, *JMR*, *JCR*, and *Marketing Science* between 2005 and 2009. Because slightly more than 1220 papers were published in these journals in that time frame, the probability of winning one of these awards is approximately 3.2%. Of the 40 paper awards, 9 (22.5%) were given to papers that had early involvement with the Marketing Science Institute (MSI), yet MSI only published a total of 108 working papers during that period. Even if we assume that all 108 MSI-related papers were published in these journals (which they were not), these data imply that the MSI-related papers were at least three times as likely to win an award as a random paper, suggesting that papers based on "big ideas," or at least ideas that interest marketing practitioners (and thus are relevant), are actually likely to be highly valued by the field, if they can get published. This observation also supports the conjecture that it is often best to start with a problem and then, and only then, determine the data and methodology needed to address it. Furthermore, if we and others are right that the review process is slanted against ideas and toward execution, the percentage of MSI-involved papers is even more surprising because one might hypothesize that these papers should have had more difficulty in the review process and therefore would be less likely to get published.

Promotion and Tenure Decisions

Another major impact on the type of research that is valued is the process associated with promotion and tenure. We examine the promotion process and the criteria that many of our institutions use to show how this process affects the emphasis on rigor and the definition of "sophisticated" research.

A major change in the promotion and tenure process over the past decade is the ability to quickly and inexpensively assess citation frequency. Citation counts have always provided one (but only one) imperfect measure of an article's impact. However, given the increased ease of data collection, citations have risen in importance and thus are widely discussed in tenure and promotion cases. Aside from arguments about the appropriate source of citation counts (ISI's Web of Science focuses only on published articles and, in general, is preferred to Google Scholar, which includes working papers that have not yet passed the screen of peer review), several other issues exist. The first is the breadth of a person's research agenda as well as the relevance of this agenda to the (much larger) basic disciplines. Generating a paper that is cited outside marketing can lead to more citations and, thus, an improved chance for tenure and for promotion. At one level, having impact outside marketing is very desirable because not only does this broaden the reach of marketing, it also generally requires the researcher to address issues believed to be important to the basic discipline. However, obtaining this reach can have the unintended side effect of leading the author to adopt the "sophisticated" conventions of the outside field. This is particularly true in cases in which the basic discipline has embraced "high-tech" methodologies and/or formulaic methodological approaches.

A second issue associated with citation counts is that although they have the advantage of being objective and favoring broadly relevant papers, they are also weighted toward topics that were relevant in the past and favor certain types of papers (e.g., reviews and new methods papers) over others. They also only capture direct references. A possible way to get around this latter point is to develop the entire chain of citations that evolve from a paper, similar to the approach that Toubia (2006) suggests in his article on idea generation. Finally, we note that citation counts are subject to game playing (e.g., citing authors you think, or hope, will review a paper).

Of course citation counts are not the only measure used for promotions. More broadly, many tenure letters and tenure cases turn, for better or worse, on counts of "A" journal publications. This discourages junior authors from putting too much in one paper, encouraging them instead to split a really good idea into its various components to maximize potential publications. A consequence of this approach is that to get the paper's contribution above some perceived threshold for publication, the author loads this "smaller" paper with methodological bells and whistles. This increases the paper's rating on execution, and thus probability of acceptance, but it also makes the work more complicated and less impactful overall.

PhD Programs

The changing landscape in terms of the review process and the subtle changes in the promotion process have not only altered the field's research agenda but also have affected marketing PhD education, which, as we show in Figure 1, has major consequences for the conduct of research and reviewing, creating a (vicious?) cycle driving research in the field. A few decades ago, most PhD programs included substantial training in relevant marketing institutional knowledge. However, this emphasis has changed. For example, at one time, a major concern in business-to-business marketing PhD programs was to increase rigor as well as relevant knowledge (Danneels and Lilien 1998). Thus, rather than exposing students to a broad overview of marketing, PhD programs have become more specialized, focusing on the technical details of a subspecialty's methodological approaches. Such training not only appropriately encourages the student to acquire knowledge in the basic disciplines but also subtly signals that these disciplines, and the practices and methods they employ, are superior to those in marketing and business. To enhance the success of such specialized programs, PhD students are increasingly drawn from underlying disciplines (e.g., psychology, mathematics, statistics). Such students frequently come into a PhD program with little or no marketing or business experience. Because many of these students are no longer required to take qualifying exams in all areas of marketing (let alone business),[3] they do not develop a sense of the range and complexity of marketing/business problems. Coupling students' lack of exposure to important marketing problems with the pressure they face to immediately begin a research program, these technically trained students tend to extend some previously published idea using their newly acquired technical expertise (often working on a project initiated by their mentor).

The emphasis on depth versus breadth has also been reinforced in the recruiting process. Many leading schools now look for, and hire, the most technically sophisticated recent graduates to "upgrade" their faculty with modern tools and thought. Less emphasis is placed on the quality of the ideas associated with a person's thesis and more on the person's technical sophistication and knowledge, whether measured in terms of some new theory in psychology or sociology or some new method of statistical estimation or economic analysis.

Suggestions for the Future

Although the preceding discussion points to several issues that merit serious consideration, we believe there is great potential for further advancement of knowledge in our profession. Thus, in the spirit of being proactive, we discuss some potential options to help rebalance idea quality and execution and, in the process, redefine what it means to produce a sophisticated research paper. We do this by first focusing on the review process and then provide some suggestions for authors.

What Editors and Reviewers Can Do

In his article, Ellison (2002) suggests that journal editors can act as forces to rebalance the review criteria. By accepting papers that reviewers have rejected because the execution of the paper is not "sophisticated" even though the paper addresses an interesting problem, the editor can provide reviewers with new information about the appropriate balance between idea quality and methodology. Ellison points out, though, that editors are reluctant to overrule reviewers because they rely on them to evaluate papers and do not want to be perceived as "lowering standards." One way to reduce the emphasis on methodology is to institute the criterion of "not being wrong." Thus, reviewers would be asked to comment on the paper's methodology in term of whether the paper was wrong and, if so, how a different (and presumably a correct) methodology would yield a different result. Thus, for example, it would not be enough to say that a researcher had omitted a factor in the analysis, it would also be incumbent on the reviewer to indicate how this omitted variable would be expected to interact with the variables of interest and alter the general findings.

We believe the appropriate technical concern when reviewing a paper is whether the approach renders the results wrong, not whether the approach is the most advanced approach available. Yes, conceptually, five measures are "better" than one or even four, but does the fact that the researcher only used one measure mean that the results should be ignored?[4] Likewise, longitudinal studies can control for common method bias, but there are times when cross-sectional studies may be acceptable (see, e.g., Rindfleisch et al. 2008) or necessary (e.g., when time-series data are not available). More broadly, a more complex method should not be required unless the results would be materially changed if that more complex approach were used. Such a criterion was used when *Marketing Letters* was founded. Indeed, the only two specific questions asked of reviewers were, "Is the paper interesting?" and "Is the paper not wrong?" These criteria of being interesting and not being wrong were also in place at *Marketing Science* in the mid-1990s (Staelin 1995). It is time for the field to more universally embrace these criteria and ask reviewers to focus on whether the paper meets the two criteria: (1) interesting and (2) not wrong. Of course, the evaluation process should also include a section on how to improve the exposition, interpretation, and so forth, but the principal emphasis should be on helping the authors better explicate their work, not specifying that the analyses need to be reformulated or requiring that the authors use a more "sophisticated" approach simply because they (or at least the reviewer) can. Recalling the survey responses we reported previously, there is widespread support in the field for such an adjustment to review criteria. Approximately 80% of respondents indicated that the editor should tell reviewers that such requests are not the prerogative of the review team.

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[3] Two of the authors took qualifying exams in such subjects as finance, accounting, and management in addition to their major qualifier.

[4] See, for example, Bijmolt and Pieters (2001), who show that using single measures often yield qualitatively the same results.

Early on, we noted that good research needs good methodology. What then is our definition of a sophisticated research paper? We put forth four criteria. A paper should be (1) reasonably realistic/general, (2) relatively simple and robust, (3) insightful (meaningful), and (4) reasonably communicable. We then apply these criteria to two broad sets of research papers currently found in our literature.

Behavioral papers. The current approach for most behavioral work can be caricatured as (1) find some theory, (2) run a series of lab experiments that examine the theory and identify an interaction (i.e., a moderating effect), preferably one that reverses the original result, and (3) report F and *p*-values for only those manipulations and experiments that "worked." Main effects are considered uninteresting/inadequate for publication (so much for F = ma, E = mc^2). Cute manipulations, such as a short paragraph used to induce a (temporary) emotion, are often viewed as clever and sophisticated.

We acknowledge that many papers of this type have produced substantial contributions (i.e., the paper is insightful). However, by forcing papers to fit into this paradigm, many issues tend to be ignored. These include general concerns about external validity (i.e., is the paper reasonably realistic?). There is also a question about the duration of effects. Would the manipulation still have impact an hour later or even after it was immediately followed by the reading of a different paragraph? (i.e., are the results reasonably general?) Moreover, by starting with an existing theory and not a problem or a new theory, there is less opportunity for a big idea. Instead, the emphasis is on execution. Why not think of sophistication in terms of a "neat" idea (meaningful/insightful) and not the application of standard procedures associated with the classic behavioral approach?

"Quant" papers. As another example, consider the current popularity of structural models and empirical industrial organization. This methodological approach is based on the obviously correct observation that individual actors (e.g., consumers, companies) both anticipate and react to the actions of other parties. It follows logically that failure to account for these actions may (note the word "may" and not "will") lead to results (e.g., parameter estimates) that are misleading/biased/wrong. In essence, this style of research is the logical descendent of the simultaneous equation regression modeling of the 1970s, with added emphasis on strategic behavior inspired by game theory and analytic modeling.

The beauty of this approach is that it acknowledges possible reactions. However, it also requires the researcher to precisely state the strategic behavior of all the players (i.e., what they know, what they pay attention to, and how far in the future they consider and plan). Moreover, the parameter estimates (and even the ability to identify some parameters) rest on these underlying assumptions. If these assumptions are incorrect, the resultant parameter estimates are biased. What is normally not known is the degree to which this bias exists (i.e., a violation our robustness criterion). This is of particular concern if the intended use of the estimates is input into a policy simulation to determine the optimal response of one of the players conditional on the reaction of the other players.

Such problems with "quant" papers lead us to believe that "sophisticated" use of such tools should rely more on examining the reasonableness of the underlying assumptions (e.g., by examining the behavioral literature) and/or doing "assumption sensitivity analysis" than on complex estimation methods. Simply asserting that people are completely knowledgeable, have infinite time horizons, and are "rational" seems more naive than sophisticated. Another approach would have the researcher also present basic descriptive statistics and reduced-form ordinary least squares (OLS) regression results. Comparison with OLS results would enable the reader to assess the degree to which the underlying assumptions are driving the solution (thereby addressing the issue of robustness). As a side benefit, because basic statistics and OLS results are "simple," they enhance the communication of the results.

What Authors Can Do

We are encouraged (see the Appendix) that the overall sentiment among authors (and, by inference, reviewers) tilts slightly toward more emphasis on interest and relevance and less toward complexity for its own sake. Nonetheless, the long-term trend has been in the opposite direction, and a "tipping point" may be rapidly approaching. As published work becomes more specialized and arcane, more potential readers both in business and academia will start to ignore it and turn to other sources for information and intellectual stimulation. In turn, the absence of their influence may encourage researchers to become even more specialized and arcane. This can lead to ever-smaller groups of researchers who reinforce their approach and even codify it as dogma. The end result of this is not desirable, because in the limit each researcher would end up talking only to him- or herself.

Fortunately, this end result is not inevitable. Faculty members in their role as authors (and peer reviewers) have the power to change the system in many ways. As an example, we supplement Ellison's (2002) prescription for change with a potential solution to the simple versus complex approach debate. When presenting empirical work, always report the results of a simple approach (e.g., OLS regression). This invites comparison to the more complex/sophisticated approach and the application of Occam's razor—that is, if two approaches generate the same result, the simpler one is preferred. It imposes an implicit requirement that the more complex approach be worth its complication in terms of producing a different interpretation rather than just, for example, a significant but small improvement in the log-likelihood function. Furthermore, publishing the simple approach encourages knowledge accumulation through meta-analysis. (In this regard, a useful requirement of empirical work would be to report means of and correlations among all key variables. This is easy to do now given that the journals also now publish electronic versions, which can contain large appendixes, tables, and so forth.) Finally, provided that the results are qualitatively similar, it would increase the communicability of the results and thus their potential to be understood at least on a basic level by a broader audience (including sophisticated but busy academic readers, MBA students, and technically sophisticated managers).

In analytical work, the gold standard is a tight closed-form solution. This does well on the simple criterion, but often at the expense of being realistic. As in the case of empirical industrial organization, many of the assumptions sacrifice "reality" to find a closed form solution. In decades past, numerical methods, grid searches, and so on, were not practical to apply. Currently, however, such methods are widely available and extensively used in, among other areas, the basic sciences. These allow for analyzing a more complex model with more believable assumptions, in effect (and paradoxically) meaning that an "inelegant" numerical method can examine more complex phenomena.

An issue associated with numerical approaches is how to display the results, because often the solution changes noticeably over the range of parameters examined. Here, presenting representative cases is useful. Even better, it is usually feasible to show (e.g., via regression) how the key dependent variable depends on the various levels of the model parameters, thus providing a (stochastic) closed-form solution. The resulting "solution" may even inspire or suggest a "law" that can subsequently be proved. (It is a lot easier to "prove a result" when you know what it is in advance.)

What Faculty Can Do

Just as we advocate balance in the reviewing criteria, we also advocate balance in PhD education and in hiring and promotion decisions. Both methodologically oriented and substantively oriented marketing academics are valuable, and both should be nurtured. This leads us to the following possible strategies for promoting a better balance between rigor and relevance.

PhD Training and Recruitment

- Give weight to the applicant's experience or at least interest level in marketing related issues in the admissions process.
- Require PhD students take an MBA-level marketing class and/or have knowledge of a broad range marketing issues before leaving the PhD program. (Note this should also help them when they begin teaching.)
- Teach doctoral seminars on substantive marketing issues.
- Encourage PhD students to start a research project with an emphasis on a problem versus starting with a data set or a method.
- Write papers and discuss with PhD students why blindly following reviewers' comments is not always the best course of action.

Faculty Hiring and Promotion

- Hire and promote marketing faculty who tackle major marketing issues.
- Measure the impact of a faculty member's research with multiple criteria that include the extent to which the work has changed the way marketing managers think about the issues and/or practice marketing.
- Read and evaluate faculty research instead of relying on the status of the journal in which the research was published. More generally, rely less on whether it is published in an "A" journal and more on the extent to which the research provides new insights.

Research Presentations and Seminars

- Reserve a substantial fraction of research presentations and seminars for topics that are broadly relevant to different types of marketing scholars as well as scholars in related fields.
- Discourage "gotcha" questions.
- Remember to comment on what is good/interesting rather than just what is imperfect or what you would have done had you chosen to work on the topic.
- Get to the meat of the research (e.g., the results) rather than getting bogged down in discussions of what others have written (i.e., the literature review) or the hypotheses.
- Remember it is their paper, not yours.

Summary

Given our discussion, the reader might wonder when the use of more complex approaches is ever appropriate. The answer is that more complex approaches are appropriate when at least most of the following criteria are met:

1. The assumptions of the more complex approach are met (and hopefully supported logically and/or empirically).
2. When there is strong theoretical support or accumulated evidence for its superiority (e.g., controlling for firm-specific effects in cross-sectional, time-series analysis of firm-level data, accounting for random individual differences).
3. When the more complex method is the focus of the research.
4. When using the more complex approach materially changes the result/interpretation.
5. When, for the intended evidence, the extra communication cost is less than the benefit provided.
6. When the method is described as simply as possible.

The major tenet of this article is that sophistication does not mean complicated. From Occam's razor (the simpler solution is preferred) to pure math (in which elegant solutions are simple vs. brute force), sophistication is associated with simplicity. The same is true for many schools of design and style, in which simple "clean lines" and limited colors (e.g., black and white) are considered elegant and sophisticated.

In the marketing literature, many of the most influential and most highly cited papers are, at their core, simple. For example, the Bass (1969) model begins with a differential equation but ends up with essentially a quadratic model that nests various diffusion patterns. Guadagni and Little's (1983) work captures state dependence simply by including an individual-level brand loyalty variable based on the last brand purchased. Thaler's (1985) transaction utility model has only two terms.

Most of the key behavioral papers examining context effects are simple in concept—for example, Huber and Puto's (1983) attraction effect and Simonson and Tversky's (1992) extremism aversion. Even Kahneman and Tversky's (1979) prospect theory, while complex in math, is basically a simple concept. It is also important that none of these papers apply complex statistical procedures to support their premises Interestingly, Wubben and Wagenheim (2008) report that for many purposes, managerial heuristics perform at least as well as more elegant approaches that use Pareto/NBD or BG/NBD models

Rather than "form follows function" (Mies van der Rohe), it seems at times that the mantra is "I have a hammer, so I'll hammer in the morning (and afternoon and evening) at pretty much anything I can reach" There is nothing wrong with developing and trying out new approaches, indeed, this is one way science advances Still, the fads and seemingly indiscriminate use of new tools after they are developed (without demonstrating that they produce noticeably different and better results in the specific application at hand) have been a bit overdone (e g , in the past, LISREL/PLS/EQS and, more recently, hierarchical linear modeling, hierarchical Bayes, and hidden Markov) Similarly, topic areas and theoretical perspectives follow predictable patterns (e g , regulatory focus theory, fluency, construal, social networks) Here again, such activity often leads to important findings, but these mass stampedes are not exactly elegant or sophisticated and predictably produce increasingly incremental insights even when the papers appear to be increasingly sophisticated (or at least complex)

Consider the use of hierarchical Bayesian methods for capturing heterogeneity Is it really more sophisticated to assume that everyone comes from some distribution with "diffuse priors" (i e , that I know nothing about the individuals) than to assume (based on theory or prior work) that individuals come from K groups with known properties (i e , a latent class approach)? Many would answer "yes" and argue that it is not possible to precisely define the groups in advance Interestingly, if it is never appropriate to use prespecified groups, why is it appropriate, and sophisticated, to assume that we know exactly how consumers and competitors behave and "constrain" a model in that way? Our point is not that one approach is right and the other wrong Rather, the point is that choices such as these involve trade-offs that are rarely considered by devotees of one approach or the other Sophisticated research is something of a craft, which can be approached with multiple tools, including (and quite effectively in many cases) with simple tools such as means, correlations, and regression

Many years ago, one of the authors had a degeneracy problem in trying to get a multidimensional scaling configuration out of ratings of relationships among foods, nutrients, and benefits to the body Because this author was attending a seminar by one of the developers of the KYST (Kruskal, Young, Shepard, and Torgerson) scaling algorithm, he asked for help The expert politely put the output aside, asked what the variables were, and then asked for the raw data After circling some of the numbers and asking what they were, he looked up and said, "You have the four basic food groups Why do you need to scale them?" It was a really good question

The moral of this story, and this article in general, is that complicated is not necessarily sophisticated, and sometimes it is just, well, complicated Sophisticated research involves good taste in problem selection (i e , studying something at least that some other relevant or important people would care about), adaptability in analysis, the use of multiple methods and sensitivity analysis to ensure generalizability, and the willingness to reconsider raw data and/or basic assumptions It involves nuanced understanding at least as much as cutting-edge methods In short, sophistication and elegance require uncommon sense Hopefully, our field will reward and see more of this in the future

Appendix

We also examined the comments provided by the respondents Of the ones that appeared multiple times, several were predictable These included frustration with conflicting reviews, multiple rounds with changing requests, what are perceived to be technically incorrect reviews, and unblind reviews and favoritism More relevant here, and consistent with our thesis, were the following comments

- "The desire for explicit evidence of 'theory' and 'psychological process' in behavioral papers has gotten really out of hand—leading to narrow and uninteresting work getting published"
- "Most of the articles in JCR are for psychologists—they are filled with way too much theory and not enough applications JMR is way too analytical with little relevance to actual marketers Is it any wonder that the highest impact marketing journal is JM?"
- "Reviewers in Psych are much more likely to accept approaches that are acceptable but are not their favorite"
- "Psych reviewers understand that ideas have a shelf time and that there is no perfect research (if the idea is interesting)"
- "The Area Editors and most of the reviewers are locked into the classic Churchill 'multiple items are always necessary' notion and they focus on statistical assessment of measures"
- "Journals are unbalanced—i e , emphasizing only theory instead of both managerial insight and theoretical insight"
- "The review process sharpens ideas and imposes discipline, but it also has the risk of making things less interesting The perfect is the enemy of the good"
- "Too much focus on 'building theory' and complex interactions, at the detriment of having managerial impact I honestly think that as a field, we are actively making ourselves obsolete in terms of usefulness to the profession"
- "The discipline (and therefore virtually all the journals) are far too focused on methodology at the expense of substantive insights Publishing marketing research appears to be more about 'tweaking' (and unnecessarily complicating) methods than it is about generating useful insights for managers"
- "Not enough focus on relevancy Conversely, and here I speak more as a reviewer, there's a predilection for complexity where simplicity would serve everyone better"
- "There's a general tendency among reviewers (and some editors) to look for complexity for the sake of complexity This is unfortunate and doesn't always lead to improved research outcomes"
- "There's not enough emphasis on (a) interestingness of the research question and (b) robustness of basic result (replication within paper) Instead there is too much emphasis on unique interpretation There's also not enough 'big picture' view in reviewing"
- "I don't see the value of forcing researchers to use a more complicated method of analysis if that method wouldn't change the implications of the paper"

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Jagdish N. Sheth

Impact of Emerging Markets on Marketing: Rethinking Existing Perspectives and Practices

The core idea of this article is that five key characteristics—market heterogeneity, sociopolitical governance, chronic shortage of resources, unbranded competition, and inadequate infrastructure—of emerging markets are radically different from the traditional industrialized capitalist society, and they will require us to rethink the core assumptions of marketing, such as market orientation, market segmentation, and differential advantage To accommodate these characteristics, we must rethink the marketing perspective (e g , from differential advantage to market aggregation and standardization) and the core guiding strategy concepts (e g , from market orientation to market development) Similarly, we must rethink issues of public policy (e g , from compliance and crisis driven to purpose driven) and the marketing practice (e g , from glocalization to fusion marketing)

Keywords emerging markets, affordability, sustainability, inclusive growth

The purpose of this article is to analyze and propose the impact of emerging markets on existing marketing perspectives and practices As Zinkhan and Hirscheim (1992) and, more recently, Sheth and Sisodia (1999) point out, marketing is a contextual discipline Context matters, and historically the discipline has adapted well in generating new constructs and schools of thought unique to the marketing discipline (Hunt 1991)

As emerging markets evolve from the periphery to the core of marketing practice, we will need to contend with their unique characteristics and question our existing practices and perspectives, which have been historically developed largely in the context of industrialized markets Most emerging markets are highly local and governed by faith-based sociopolitical institutions in which public policy matters They also suffer from inadequate infrastructure and chronic shortage of resources Most of the competition comes from unbranded products or services, and consumption is more of a make versus buy decision and less about what brand to buy Therefore, many beliefs that are fundamental to marketing, such as market segmentation, market orientation, and brand equity, are at odds with the realities of emerging markets At the same time, the growth of emerging markets offers great opportunities to develop or discover new perspectives and practices in marketing, which may become valuable for the neglected and economically nonviable markets in advanced markets This will require a mind-set change in the way we perceive emerging markets

This article is divided into four parts In the first part, I describe why and how growth of emerging markets is inevitable In the second part, I focus on the five unique characteristics of emerging markets and their inherent comparative advantages In the third part, I discuss how we will need to rethink marketing theory, strategy, policy, and practice in light of the unique nature of emerging markets I also offer several propositions for further research In the final section, I provide implications for marketing practice, function, and research

Growth of Emerging Markets

A major recent context is the growth of emerging markets (Gu, Hung, and Tse 2008, Hitt et al 2000, Hoskisson et al , 2000) It is estimated that by 2035, the gross domestic product of emerging markets will permanently surpass that of all advanced markets (Wilson and Purushothaman 2003) On a purchasing power parity index, China is already equivalent in market power to the United States, and India is the third largest market, according to International Monetary Fund 2008 data Just as the last century was all about marketing in the advanced economies, this century is likely to be all about marketing in the emerging markets (Engardio 2007, Sheth 2008, Sheth and Sisodia 2006) Therefore, the fundamental question to consider is this Will the emerging markets be driven by marketing as we know it today, or will the emerging markets drive future marketing practice and the discipline?

Several factors are responsible for the growth of the emerging markets First, economic reforms in Brazil, Russia, India, and China (BRIC) have unlocked markets protected by ideology and socialism As a result, some of the best capitalist markets today are ex-communist or ex-socialist countries This policy change has resulted in creating altogether new markets for branded products and services Second, all advanced countries are aging, and aging very rapidly As a consequence, their domestic markets are either

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stagnant or growing very slowly Their future growth seems more destined to come from emerging markets Third, worldwide liberalization of trade and investment, bilateral trade agreements, and regional economic integrations such as the ASEAN, Mercosur, and the European Union have resulted in global competition and global product and service offerings with unprecedented choices of branded products, especially in emerging markets

Finally, the emergence of the new middle class, especially in large population markets such as China and India, is creating large-scale first-time buyers of everything from processed foods, soaps and detergents, and personal care products to appliances, automobiles, and, of course, cell phones The numbers are staggering China is destined to become the largest single market for virtually all products and services in both household and business markets It has already surpassed 700 million cell phone subscribers, more than three times that of the U S market, and still continues to grow India has already reached 500 million subscribers and is adding at least 100 million net new subscribers each year This is also true of consumer electronics, appliances, and automobiles as well as industrial raw materials, such as cement, steel, and petrochemicals

This growth is further enabled by the democratization of information, communication, and technology and by the spectacular rise of local entrepreneurs, especially in the BRIC countries It has generated unprecedented wealth in a very short time For example, China has now more than one million millionaires, and India is not far behind In a recent survey, *Forbes* declared Carlos Slim from Mexico the richest billionaire in the world, surpassing both Warren Buffet and Bill Gates

What is also unique about the emerging markets is that they have produced large-scale domestic enterprises (native sons), which are often larger in their domestic markets than the largest multinational corporations from the United States, Japan, Europe, South Korea, Canada, and Australia For example, Haier just surpassed the largest global appliance maker, Electrolux, in units sold, and China Mobil has more subscribers than Vodafone Similarly, Huawei Technologies surpassed both Alcatel-Lucent and Ericsson-Nokia in telecommunications infrastructure manufacturing Similar patterns are replicated by Russia in the energy sector, by India in the tractor and motorcycle industries, and by Brazil in the beer industry (Ramamurthi and Singh 2009)

Marketers from the emerging markets are now globally expanding, especially in other emerging markets, such as Africa, Latin America, Central Asia, and the Middle East They are also becoming major global competitors in advanced markets through acquisitions and organic growth While this seems parallel to what happened in Japan and South Korea, with companies such as Komatsu, Mitsubishi, Toyota, Sony, Hyundai, LG Industries, and Samsung, the domestic scale advantage in favor of the Chinese, Indian, and Russian multinationals is far greater Most important, these large domestic enterprises have been innovative, nontraditional, and nationalistic in their marketing strategy and tactics and often contrarian to marketing practices of advanced markets

Extant Research on International Marketing

The marketing discipline has a rich history of both empirical research and conceptual thinking on international markets (Jain 2003) This research can be classified into four areas

1 Why do products flourish here and fizzle there? Failure of well-established products in emerging markets is attributed to lack of sensitivity to local cultures (Ghemawat 2001, Hofstede 2001, Sommers and Kernan 1967)
2 Should a company extend its marketing mix (the four Ps of marketing), or should it adjust it to suit the local markets? This question has sparked significant debate and research on what is labeled the "standardization versus localization debate" (Jain 1989, Keegan 1969, Levitt 1983) and ultimately in a compromise called "glocal" marketing ("Think global, Act local"), first suggested by Honda Motors (Quelch and Hoff 1986) Most recently, Schilke, Reinmann, and Thomas (2009) have empirically concluded that several organizational factors moderate whether standardization is positively correlated with performance
3 Are there country-of-origin effects, especially in emerging markets in which the image of an advanced country is often an advantage? Numerous studies, both experimental and empirical, have demonstrated how "Made in" labels create differential advantage Examples include French wines, German cars, Italian leather goods, and Swiss watches This line of research has also focused on how countries have transformed themselves from having an image of being makers and marketers of low-quality/low-price products to makers and marketers of high-quality/high-price products, including products made in Japan, Korea, and, more recently, China and India Finally, there is some research on country-of-origin effects in counterfeit products and the emergence of gray markets
4 Can brands be global or should they be local or regional? While there is little debate about the globalization of corporate brands such as IBM, Hewlett-Packard, Toyota, Samsung, Sony, Vodafone, Accenture, and Siemens, there is still significant controversy at product levels, particularly in consumer packaged goods In general, there is worldwide rationalization of brands into a few master global brands to gain economic efficiency of branding, packaging, and marketing

The typical antecedents in research on international marketing are marketing variables such as positioning, segmentation, pricing, advertising, and distribution, typical moderating variables have been culture, government policy, administrative rules and regulations, and level of economic development The most common outcome variables are entry failure or success, premium pricing, market share, and profitability Finally, the most common mediating variables are consumers' predisposition and local competition

The tone of this research seems to be colonial in its mind-set about emerging markets, probably because they are former colonies of Europe—in particular, France and the United Kingdom This colonial mind-set conjures up the images of African tribal chiefs, the natives in the Americas, snake charmers in India, fake products (knockoffs) in

China, and adulterated products offered by nonregulated vendors with a great deal of haggling and price negotiations Markets are viewed as informally organized into bazaars, which specialize in product categories such as fish, fresh produce, jewelry, garments, and agriculture commodities (e g , rice, wheat, lentils)

In my view, marketing as a discipline will benefit enormously if it can transcend the prevailing beliefs, stereotypes, and research traditions about the emerging markets Fundamentally, emerging markets must be viewed as core and not tangential or peripheral to a company's mission and strategy New learning and research opportunities are abundant if only we are willing to change our mind-set about emerging markets

Characteristics of Emerging Markets

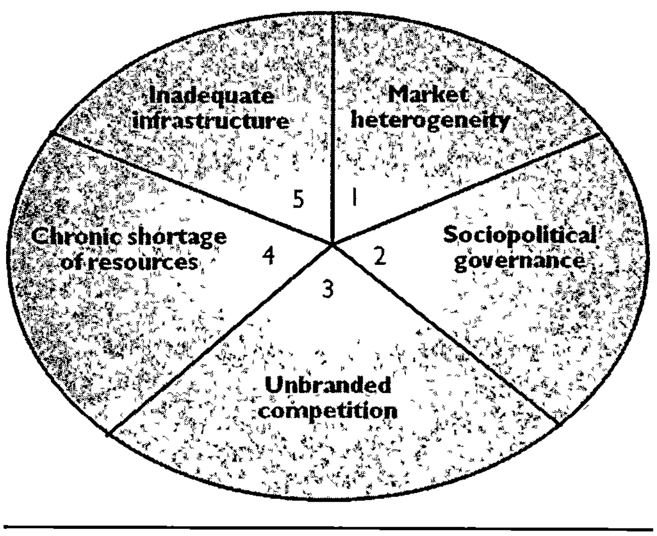
I have identified five dimensions on which emerging markets are distinctly different from mature markets Each one has significant impact on at least one of the four areas of marketing (theory, strategy, policy, and practice) and often on all four areas Each of the following five subsections describes these dimensions (see Figure 1)

Market Heterogeneity

Emerging markets tend to have very large variance relative to the mean across almost all products and services This is because markets are local, fragmented, low scale, and mostly served by owner-managed small enterprises They reflect the reality of preindustrialization and, therefore, reflect characteristics of market heterogeneity comparable to a farming economy

Heterogeneity of emerging markets is further compounded by large skewness (as much as 40%–50%) toward what is referred to as the "bottom-of-the-pyramid" consumers, who are below the official poverty level of less than two dollars a day income These consumers have no access to electricity, running water, banking, or modern transportation, until recently, they had no access to telephone or television Most of them are still illiterate and, therefore, do not read newspapers, magazines, or books More important, heterogeneity of emerging markets is less driven by diversity of needs, wants, and aspirations of consumers and more driven by resource constraints, such as wide range of haves and have-nots with respect to both income and net worth Similarly, the diversity with respect to access to products and services tends to be enormous between urban and rural households

FIGURE 1
Five Characteristics of Emerging Markets


Inadequate infrastructure
Market heterogeneity
5
1
Chronic shortage of resources
4
2
Sociopolitical governance
3
Unbranded competition

This suggests that affordability and accessibility may be more important for differential advantage than a superior but expensive product or service with limited access In short, it is less of a case of demand generation and more a case of demand fulfillment

Sociopolitical Governance

Emerging markets tend to have enormous influence of sociopolitical institutions These include religion, government, business groups, nongovernmental organizations (NGOs), and local community Markets are more governed by these institutions and less by competition It is not unusual to have numerous government-owned and -operated enterprises serving the markets with monopoly powers For example, until recently, most communist markets were served only by government enterprises as monopolies with limited or no choice Even today, it is important to understand the rise of these enterprises as global competitors Examples include Gazprom (Russia), Petrobras (Brazil), CNOOC (China), and India Coal (India) in the energy sector alone

Similarly, a few highly diversified trading and industrial groups dominate the emerging markets Examples include the Tata, Birla, and Reliance Groups in India, the Koch Group in Turkey, the Perez Companc Group in Argentina, and many similar business groups in Mexico, Indonesia, and Brazil Furthermore, these highly diversified business groups have access to, and influence on, government's planning and policy changes They are also often considered favorite sons or crown jewels of the nation

In many of the subsistence markets, defined as rural households with income less than two dollars a day, the closed-loop system of the merchant consumer also generates local market submonopolies with affective, continuance, and normative commitments between producers, merchants, and consumers (Viswanathan, Rosa, and Ruth 2010) Therefore, it is difficult for a new entrant to break into these markets

Finally, there are many emerging markets anchored to faith-based political governance, such as Saudi Arabia and several Gulf countries in the Middle East and parts of Africa This situation often results in an asymmetric faith-based market power

Therefore, sociopolitical institution perspective is important to understand and incorporate in our research as emerging markets become more accessible through liberalization, privatization, or economic integration This market imperfection and asymmetry of market power by national marketers (both government and business groups) will require us to rethink our theories of competitive advantage anchored to industry structure or resource advantage perspective.

Unbranded Competition

As much as 60% of consumption in emerging markets so far has been for unbranded products and services, for at least two reasons. First, many branded products and services are still not available in rural markets for a variety of reasons, including lack of access, poor infrastructure, and higher cost of doing business. A second, and more important, reason is that a household is not just a consumption unit but also a production unit. There is an enormous value-add through labor on making consumable products from raw materials for all basic necessities, for example, households cooking, cleaning, building their own homes, and sewing their own clothes is still prevalent in most subsistence markets and also among the urban poor consumers, such as the slum dwellers.

Outsourcing is minimal, partly due to availability of labor at home (women and children) and partly due to lack of affordability of branded products and services. Even when a given value-added activity is outsourced, such as making garments, it is done by a tailor who makes and supplies a nonbranded custom garment. The same is true for lenders (deposits and borrowing), barbers, butchers, and bakers. Milk is also often delivered at home unbranded, as are fresh fruits and vegetables. It is also surprising that as much as 50%–65% of the market for jewelry, liquor, luggage, appliance, personal computers, and some consumer electronic products is served by unbranded producers.

A second aspect of unorganized competition is the prevalence of used products as direct competitors. Products tend to have longer life cycle than ownership. Similarly, adulteration, duplication, and imitation are far more prevalent due to lack of regulation, standardization, compliance, and enforcement.

A third aspect of unbranded competition for products and services is the prevalence of barter exchange or reciprocal offerings. In other words, market price as a mechanism to address market efficiency from a transaction cost economics perspective, as proposed by Williamson (1976), may require adding a second dimension to the continuum between market and hierarchy. Unbranded products and services as a unique characteristic of emerging markets suggests that market creation (from making to buying) and market development may be more necessary (and potentially more profitable) than market orientation.

Chronic Shortage of Resources

Emerging markets tend to have a chronic shortage of resources in production, exchange, and consumption. For example, chronic shortage of power (electricity), spotty supply of raw materials, and lack of skill-based labor tend to make production sporadic, inconsistent, and nonreplicable. Consequently, it results in diseconomies of scale. Similarly, exchange has high transaction costs as a result of lack of scale and inadequate financial, physical, and other support mechanisms. Finally, consumption also tends to be constrained with respect to time and location because of the lack of electricity, running water, and physical space.

Resource improvisation perspective may be a key to the future of product innovation, product distribution, and product usage. Therefore, our current perspectives of resource- or capability-based advantage may need to be supplemented by resource improvisation advantage. This means innovating low-cost, affordable products and services that are also consumption efficient and versatile in alternate access and exchange.

Inadequate Infrastructure

Just as there is a chronic shortage of resources and a disproportionate size of below-poverty-level consumers (subsistence economy), another characteristic of emerging markets is inadequate infrastructure. Infrastructure includes not only physical roads, logistics, and storage but also market transaction enablers, such as point-of-sale terminals, and basic banking functions, let alone credit cards. It also means lack of communication, information, and transaction technologies, such as telephones and electricity. While the large metro areas may have adequate infrastructure, in general this is not the case in the rest of the market.

The exchange of goods and services called "commerce" has been a central concern of society for endless centuries. Humans realized long ago that creating a centrally located "hub" for such exchange was the most efficient way to organize commerce. As a result, ancient civilizations often flourished around cities rather than countries. Athens, Rome, Babylon, Venice, and Florence—all city-based Western civilizations—were also major trading centers of their time. Each had a natural location advantage around which it organized an elaborate system to facilitate trading.

In the agriculture days, the natural location advantage was usually access to water-based transportation, namely, rivers and seaports. Around that, an infrastructure was usually developed that became the local exchange—the bazaar. In conducting business in well-developed markets, marketers take the presence of an exchange infrastructure for granted. The elements of such an infrastructure include a sophisticated logistical system for the distribution of goods, a transportation system that enables customers to reach stores easily, ubiquitous telecommunication services, financial services to expedite monetary exchange, the availability of well-targeted broadcast and print media, and so forth. Although such infrastructure is now widespread throughout much of the industrialized world, its absence in emerging markets can derail a marketing manager's efforts to facilitate efficient and profitable exchange (Sheth and Sisodia 1993). Therefore, nontraditional channels and innovative access to consumers may be both necessary and profitable in emerging markets. For example, the most profitable and largest market for Avon Products is now Brazil because it has been able to organize one million independent agents as its sales and delivery force.

Comparative Advantage of Emerging Markets

The rise of the emerging markets is less than three decades old However, enough observational evidence, case studies, and professional books exist to catalog new learning and suggest significant new research opportunities for marketing scholars There are three areas in which the emerging markets seem to have comparative advantage (Hitt et al 2000, Hoskisson et al 2000) I describe these three areas in the following subsections

Policy-Based Comparative Advantage

Without economic reforms and strong industrial policy, emerging markets would have remained stagnant, as evidenced by remarkable transformation through economic reforms in Eastern Europe, Russia, Central Asia, Latin America, and, of course, China and India Therefore, a fundamental research question in marketing is, What is the role of government policy in organizing markets? How does it differ from the free market forces or the Darwinian theory of population ecology?

Is it more efficient and effective for government-mandated standards to create markets than the traditional competitive free market forces? For example, it was the Pan European government-mandated standard that resulted in GSM as the dominant standard for the cell phone industry Ironically, while the United States invented the cellular technology and successfully commercialized it, the competitive market processes resulted in multiple standards (e g , AMPS, TDMA, CDMA, GSM) and eventually a disadvantage to the industry and the nation This is because it resulted in lack of scale in an industry that is otherwise primarily fixed-cost As a consequence, in the handset business, Motorola, a pioneer, lost the market leadership to Nokia and more recently to Samsung In short, policy matters

Ironically, unlike in advanced countries, it is the state-owned enterprises of emerging markets—especially in China, Russia, Mexico, Brazil, and India—that have emerged as domestic market leaders and are now aspiring to become global leaders As mentioned previously, they include Gazprom, Petrobras, Huawei Technologies, China Mobil, State Bank of India, India Post, and ONGC

The range of government policy as a comparative advantage is also impressive It ranges from government as the largest customer to providing economic incentives for exports to protecting fledgling domestic industries from foreign competition to developing special economic zones Indeed, the success of China, similar to that of Singapore, Japan, and Korea in the recent past, is directly attributed to its export-oriented industrial policy as well as use of special economic zones

More recently, Turkey has initiated a multimillion-dollar marketing initiative called TURQUALITY to globalize its world-class domestic Turkish brands This includes providing total quality management and branding expertise as well as modern management education to selected companies (mostly family-owned enterprises) over several years Another key aspect of government policy is the injection of social objectives in marketing, especially in education and health care Finally, many governments have negotiated bilateral free-trade agreements or regional economic integration to provide greater market access

Despite this vast influence of government policy in opening and organizing markets, it is surprising that we have very limited empirical research or conceptual theory about government policy as comparative advantage Kotler (1986) was the first marketing scholar who suggested the role of public policy by adding two more Ps—policy and public relations—to the four Ps of marketing Perhaps the most insightful articulation of how President Lincoln's policy of transforming the United States from an agricultural to an industrial society and its relevance to emerging markets is by Robert Hormats (2003) In marketing, while we have a good understanding of impact of regulations on marketing such as unfair trade practices, product safety, and advertising to children, what we need is a much deeper understanding of government policy in organizing markets

Raw Material–Based Comparative Advantage

Emerging markets have enormous raw material advantages ranging from human capital (China, India), industrial raw materials (Brazil, Central America), energy (Russia, Nigeria), and other natural resources (Peru, Africa) Many of these markets also have strong agricultural (Brazil) and cattle-based natural resources (India)

In addition, most of the emerging markets today have access to capital and technology to do value-add on these resources rather than export them as raw materials Combine this with the rise of entrepreneurship, and it is inevitable that raw material–based advantage will be key for research in marketing strategy Ricardo (1817) was the first economist to advocate a resource-based view of comparative advantage with a nonintuitive strategy of outsourcing or exiting an industry even if the country was the lowest cost producer or had a differential advantage This is because it could do more valuable economic activity with its resources and move up the value chain from agriculture to industrial economy This implies investing in emerging markets for access to raw materials (supply chain and sourcing) as well as participating in local markets, as a strategic advantage

We need to understand if and how raw material–based comparative advantage may accrue to marketers from the emerging markets both domestically and globally For example, out of nowhere, India recently became a dominant country for the global information technology (IT) and IT-enabled service outsourcing industry because of its large pool of English-speaking software engineers It seems now poised to be the global hub for other professional services, such as accounting, legal, investment banking, and consulting, as well as design and research and development, across numerous sectors of the economy And of course, China is already a large manufacturing and sourcing destination for the world Similar examples include Tata Tea (with acquisition of Tetley Tea), which has become the number two marketer in the world because of its access to, and ownership of, tea plantations

Should a company exit an industry even though it is globally competitive to redeploy its resources and capabilities to take advantage of higher-valued emerging technologies, either homegrown or strategically acquired? IBM seems to have followed this strategy successfully by exiting the low-margin personal computer business and aggressively investing in IT and consulting services. This also seems to be the case for most industries that are permanently shifting from analog to digital technologies and from hardware to software services. More recently, General Electric has restructured itself from a highly diversified conglomerate to a focused global enterprise in infrastructure, capital, and health care markets by exiting its traditional lighting and appliances businesses.

In short, we need empirical research on exit strategy based on the theory of comparative advantage to enhance market capitalization value. Such research will be invaluable in the media industry, in which both newspaper and broadcast media are permanently shifting to broadband and social media. In some ways, the enormous success of Google, Apple, and Amazon.com in creating a strong market franchise, developing customer loyalty, and consequently commanding a premium in market valuation needs to be scientifically researched as part of marketing strategy.

NGO-Based Comparative Advantage

Kotler and Levy (1969) coined the phrase "social marketing" in the marketing discipline. It was based on the observation that many of the tools and concepts of marketing, such as branding, positioning, and targeting, can be easily extended to the nonprofit sectors, including arts, culture, museums, public libraries, and parks and recreation, in addition to education and health care. In short, the nonprofit sector can and should embrace marketing practices even though there is no profit motive. Kotler (1972) further extended the generic concept of marketing, articulating that marketing as we know it today is generalizable to all types of market and social transactions that result in exchange or some form of reciprocity.

Surprisingly, the reverse seems to be occurring in emerging markets. The NGOs in emerging markets are pioneering new and nontraditional marketing practices on a scale unimagined at one time. They are also reaching inaccessible markets. Examples include the Grameen Bank (microlending) in Bangladesh and AMUL (dairy cooperative), Pratham (Urban Slums), and Jaipur Foot in India.

The NGOs worldwide seem to have blended the modern business practices with social purpose. As Mahajan and Banga (2005) point out, 86% of the population in emerging markets has yet to experience the benefits of the Industrial Revolution, such as running water and electricity. Similarly, Prahalad and Hammond (2002) articulate how the base-of-the-pyramid market can be very profitable for traditional products and services if business can innovate on affordability and accessibility to the vast untapped markets, especially in the rural areas (Anderson, Markides, and Kupp 2010; Cachani and Smith 2008; Garrett and Karnani 2010).

There are two key concepts with respect to the NGOs from emerging markets, which may be very useful for research in marketing. The first is "inclusive marketing." In other words, how can one serve a vast majority of consumers who are below the poverty level of two dollars a day with innovative access and make products or services affordable to them? While the traditional examples of packaging shampoos into single serve units or reducing the size of Coca-Cola to a smaller size are useful, the real breakthroughs and nontraditional concepts and practices seem to be with the newer NGOs. For example, NGOs such as the Gates Foundation and the McArthur Foundation are now emerging as large multinationals capable of acquiring or investing in some of the best for-profit consumer companies.

A second key concept is "public–private partnership," in which both the government and the private sector agree to pool resources and expertise to focus on societal needs that the free market processes and marketing fail to address. Led by the World Bank, this public–private partnership model of serving unserved markets on a sustainable basis is a fascinating area of research in marketing. Worldwide experiments in countries such as Mexico, Peru, India, Malaysia, and parts of Africa offer a very large pool of data for research opportunities in marketing.

Rethinking Existing Perspectives and Practices

Rethinking Marketing Theory

Marketing theory presumes that customers have choices and that the role of marketing for a company is to make its offerings the customer's choice. Therefore, it presumes that in a monopoly, there is no need to market because customers have no choice. Conversely, in contestable markets, the role of marketing is critical, and it must create a differential advantage, which is presumed to result in superior financial performance.

Over the years, several marketing scholars have proposed their own theories or perspectives on how marketing can create a differential advantage, or they have used frameworks developed in other disciplines—most notably, economics and sociology—to empirically test them in the marketing context (Hunt 2010). I briefly discuss three of them in the following subsections and then suggest how the context of emerging markets, with its unique characteristics, may require some rethinking (see Table 1).

From differential advantage to aggregation advantage. Wroe Alderson believed that a company must grow to survive, and to grow, it must constantly struggle to develop, to maintain, or to increase its differential advantage (for a discussion, see Hunt 2010). Alderson believed that differentiation was the foundation of marketing theory. Given the heterogeneity of demand and competition for differential advantage, heterogeneity of supply is the likely outcome, resulting in variety in offerings, including many variations or stockkeeping units of the same generic kind of good. It also means segmenting the market.

While heterogeneity is one of the key characteristics of emerging markets, the inference that can be drawn is quite the opposite. As discussed previously, emerging markets

TABLE 1
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Product Category	From	→	To
Marketing theory	a Differential advantage b Industry structure c Resource possession		a Aggregation advantage b Government policy c Resource improvisation
Marketing strategy	a Market orientation b Relationship marketing c Customer satisfaction		a Market development b Institutional marketing c Convert nonusers to users
Marketing policy	a Compliance b Excessive consumption c Finance driven marketing		a Inclusive growth b Mindful consumption c Purpose driven marketing
Marketing practice	a Glocalization b Diffusion of innovation c Country of origin advantage		a Fusion b Democratization of innovation c Nation brand advantage

tend to be high in market heterogeneity and therefore are highly fragmented They also tend to have a skewness of 40%–50% of subsistence consumers This is further compounded by family-owned businesses, which perpetuate or add to fragmentation for the sake of family succession planning The consequence, contrary to Alderson's conclusion that differential advantage results in better margins or profits for the firm, is simply not true in emerging markets There is too much competition, and margins tend to be paper thin Businesses exist more on cash flows and wageless family labor They survive not as much for growth as they do simply for survival

What is needed in emerging markets, therefore, is greater standardization by reducing the variety and aggregating demand to achieve scale efficiency and better returns on investment (Levitt 1983) What a company needs, therefore, is aggregation and standardization advantage How a company standardizes and aggregates demand from highly fragmented and disbursed demand across thousands of rural villages and remote locations is key to growth and survival It is not surprising that Wal-Mart, which has mastered the art of aggregating and standardizing rural demand with its hub and spoke logistics system, has become the largest retailer in the United States in fewer than 30 years, surpassing powerful incumbents including Sears, Kmart, and Kroger

> P_1 In a highly heterogeneous demand and heterogeneous supply market, aggregation advantage results in better financial performance than differential advantage

From industry structure to government policy The industrial organization perspective maintains that the profitability of an industry is determined by five forces of competition (Porter 1980) These include rivalry among existing competitors, threat of new entrants, threat of substitute products and services, bargaining power of suppliers, and the bargaining power of customers Therefore, choosing an industry that is less competitive will, by definition, generate better profitability Industry concentration is a good indicator of low competition, and it is typically measured by market share distribution In addition, a company even in a very competitive industry can earn superior returns if it chooses the right strategy among three mutually exclusive strategies cost leadership, differentiation, and focus

Finally, a company must focus on activities in its value chain (both primary and support activities) to offer a superior value in its chosen strategy (cost leadership, differentiation, or focus) If value is defined as what the market is willing to pay, superior value stems from offering lower prices than competitors for equivalent benefits or providing unique benefits that more than offset a higher price (Hunt 2010)

Sheth and Sisodia (2002) propose an alternative industry structure model Each industry consists of three full-line generalists (constituting an oligopoly) that have volume and velocity advantage, as well as numerous product or market specialists (monopolistic competition) that have the margin advantage through selection and service Thus, each industry is a combination of part oligopoly and part monopolistic competition Both generate above-average returns relative to others Therefore, a firm must decide whether it wants to be a full-line generalist or a multiproduct–multimarket specialist In retailing, it means whether a firm wants to be Wal-Mart or Target, or does it want to be a specialty retailer, such as Foot Locker (product specialist) or The Limited (market specialist) Because strategies and capabilities are different, a firm must decide between these two choices and gain the respective competitive advantage Uslay, Altintig, and Windsor (2010) have recently tested Sheth and Sidodia's model of competition empirically

The presumption of industry structure theory is that market size is fixed and is a zero-sum game of gaining market share However, it is the opposite situation for emerging markets, in which growing the market with increasing competition is likely to result in greater profitability and, even more important, in the market cap of the company The best example is the Indian wireless industry, in which private-sector participation expanded the total market and has delivered profitable growth at the lowest prices in the world, and the market valuation of both private and state enterprises is far greater than the industry price–earnings ratio

> P_2 In markets in which growth has been regulated by government policy, growing the total market demand by policy

> changes results in better financial performance than industry concentration.

From resource possession to resource improvisation. The resource-based view maintains that resources are both significantly heterogeneous across firms and imperfectly mobile. Therefore, a firm that possesses resources that are valuable, rare, imperfectly mobile, and inimitable will gain competitive advantage (Wernerfelt 1984). Resource-based advantage theory has become popular in marketing, with a focus on intangible assets such as brands and customers. As discussed previously, a key characteristic of emerging markets is a chronic shortage and heterogeneity of resources. If necessity is the mother of invention, then resource shortage is the father of innovation.

In emerging markets, therefore, a company gains advantage by learning to improvise with scarce resources and, in the process, to become more innovative relative to its competition. Innovation through improvisation may occur with respect to each of the four Ps of marketing: product, price, place, and promotion. It also includes improvisation as a consequence of a lack of primary and enabling infrastructures, a lack of skilled workforce, and a lack of access to low-cost capital. This is referred to as *juggad* in India.

There are numerous case histories that validate this observation, such as the Grameen Bank in Bangladesh, milk cooperatives such as AMUL in India, and Avon products in Brazil, as mentioned previously. It also includes the recent success of General Electric in medical instruments in China and India.

> P_3: In markets with a chronic shortage of resources, improvisation results in better financial performance than possession of differentiated resources.

Rethinking Marketing Strategy

In this section, I focus on three marketing strategies that have become mainstream for empirical research in marketing: market orientation, relationship marketing, and customer satisfaction. I suggest how the rise of emerging markets will affect each of them.

From market orientation to market development. Recently, the market orientation perspective articulated by Narver and Slater (1990) and by Kohli and Jaworski (1990) has become a dominant paradigm in marketing. "The fundamental imperative of market orientation strategy is that, to achieve competitive advantage and, thereby, superior financial performance, firms should systematically (1) gather information on present and potential customers needs and (2) use such information in a coordinated way across departments to guide organization wide responsiveness to meet or exceed them" (Hunt 2010, p. 413).

Market orientation can be traced back to the marketing concept articulated and developed in the early 1960s, in contrast to production or sales orientation. "The marketing concept maintains that all areas of the firm should be customer-oriented, (b) all marketing activities should be integrated, and (c) profits, not just sales, should be the objective. Knowing one's customers and developing products to satisfy their needs, wants and desires, has been considered paramount" (Hunt 2010, p. 413).

As discussed, emerging markets include the consumption of, and competition from, unbranded products and services. Indeed, most consumers make products at home. Many consumers have no brand or product knowledge. Often, they do not even know how markets operate. They largely depend on an intermediary, who provides selective information, selective choices, and cash flow financing. Therefore, it is difficult to generate market intelligence pertaining to current and future customer needs. It seems that in emerging markets, markets are created by shaping customer expectations, not by assessing them. Indeed, it is often a "field of dreams": If you build it, they do come. This has clearly been the case in China for fast foods and automobiles. The same seems to be true in Russia and India. Because markets are informal and unorganized as a result of a lack of adequate infrastructure, what matters most in emerging markets is market development strategy: marketing accessible and affordable branded products and services.

As mentioned previously, Avon Products has taken this approach in Brazil with a million-plus agents by organizing selling and distribution systems along with microfinancing. Similarly, market development has been the backbone for public telephones in India, which uses a franchise system. Similar stories abound for Bata Shoes in Africa and in India. Indeed, this has been the strategy of Huawei Technologies in the telecommunications infrastructure industry in Africa and for Life Insurance Corporation of India, which offers life policies in rural markets. Probably the best example is the success of Western Union, which has organized a global money transfer system for migrant workers. Historically, franchising has been the most popular approach to market development, such as the pioneering success of Holiday Inn, McDonald's, and Ace Hardware in the United States.

> P_4: In markets consisting of unbranded competition for products and services, market development delivers better financial performance than market orientation.

From relationship marketing to institutional marketing. Since the growth of the services economy, there has been a shift in marketing toward understanding and managing long-term relationships with individual customers. Specifically, in many service industries, such as telephone, utilities, and banking, once a customer establishes an account, he or she stays in the relationship unless there is an exogenous event, such as physical move or divorce. Alternatively, some disruptive change initiated by the service provider destabilizes the relationship. Therefore, postsales activities and experiences through customer support are crucial in relationship marketing. Also, rather than fight for market share, marketing strategy shifts toward "share of wallet" by offering the same customer a portfolio of services. This is common in financial services and in telephone services, including bundling, for example. This leads to calculating the lifetime value of the customer and customer profitability analysis (Kumar and Peterson 2005).

Relationship marketing establishes competitive advantage by attracting, developing, and maintaining relationships with customers through building trust and making commitment of resources to customers (Hunt 2010) In emerging markets, the concept of relationship marketing is very useful However, the target may not be the end customer Given that emerging markets are governed by sociopolitical and faith-based institutions such as the government, religion, NGOs, and the local community, it becomes necessary to attract, develop, and maintain relationships with institutions and their leadership This has been well documented in research on the diffusion of innovation in the farming community, in which it is important to establish a relationship with opinion leaders of the community This has been also found to be true in the medical community for adoption of new drugs In other words, establishing and sustaining a relationship with market makers is as important as with customers Fortunately, there is a well-established theory of institutional economics that may be useful in developing institutional marketing strategy (Gu, Hung, and Tse 2008, Hoskisson et al 2000)

> P_5 In markets governed by sociopolitical institutions, it is more important to attract, develop, and maintain relationships with institutions and their leaders than with end customers for superior financial performance

From customer satisfaction to converting nonusers into users Customer satisfaction emerged as a key marketing strategy in the 1980s as a way to regain global competitiveness after the first energy crisis of the late 1970s Because Japan had emerged as a successful global competitor to the United States in many industries, including television, watches, and automobiles, the Malcolm Baldrige Quality Award from the U S government, anchored on customer satisfaction, became a part of corporate strategy

While satisfaction was a key construct in Howard and Sheth's (1969) theory of buyer behavior as a way of understanding how postpurchase experience compared with prepurchase expectations (attitude) reinforced the decision resulting in brand loyalty, it became part of marketing strategy only in the 1980s This led to growth of J D Power's customer satisfaction index in the automobile industry and eventually virtually across all consumer and some business products and services

Finally, Fornell et al (2006) developed a cross-industry aggregate index at a national level They also linked their customer satisfaction index to a company's financial performance, including market cap of the company

Several professional books by Frederick Reicheld and the development of Net Promoter Score gained top management attention As mentioned previously, the concept of CLV and profitability at the individual customer level resulted in modeling the economic value of customer centricity (Kumar and Peterson 2004, Kumar and Shah 2009) It also led to developing customer equity as an intangible asset as important as brand equity

The stream of research still continues to grow with access to large-scale end-customer data (especially in the telephone and banking industries) and affordable data-mining tools and techniques It has become a core part of modeling research in marketing

Emerging markets, with their unique characteristics of unorganized markets and lack of adequate infrastructure, including media and distribution, suggest that what is equally important is to convert nonusers into first-time users The real challenge and opportunity is to convert nonusers to users, whether it is for automobiles, motorcycles, cell phones, television sets, banking and insurance, or household products and services The real competition lies in the make versus buy decision Therefore, it is necessary to develop a marketing strategy around the economic, social, and emotional value of outsourcing As Williamson (1976) points out, transaction cost economics is fundamentally the economics of make versus buy choices on a continuum from markets (outsourcing) to hierarchy (insourcing)

In emerging markets, it is the reverse shift What motivates consumers to outsource (buy) homemaking activities, such as cooking, cleaning, and child care? Is it strictly an economic decision, or is it influenced by social and behavioral considerations? For example, why do rural farmers buy branded blue jeans and T-shirts when, at the same time, they consume unbranded daily necessities? Are there social or emotional reasons emerging-market consumers tend to be more brand conscious?

What matters most from a marketing perspective in outsourcing decisions is informing, educating, and enabling customers through workshops, social media, and channel development This is similar to what happens for new technology breakthroughs such as personal computers, industrial automation, and operating software systems In short, what matters most is creating first-time users It requires homogenization of expectations through framing, incentives, and development (Sheth and Mittal 1996)

> P_6 In markets that largely consist of self-made products and services, converting nonusers to first-time users results in better financial performance than satisfying existing users

Recent examples of success by Starbucks, McDonald's, and Coca-Cola in China, and similar successes by Subway and Domino's Pizza in India, provide validation of this proposition

Rethinking Marketing Policy

Historically, marketing policy has been compliance driven with respect to each of the four Ps Product is regulated by multiple agencies (the Food and Drug Administration, U S Department of Agriculture, and the Product Safety Commission) with regard to safety, disclosure, and labeling Similarly, pricing is regulated by multiple agencies (the Federal Trade Commission and the U S Department of Justice's Antitrust Division) for predatory pricing, price fixing, monopoly pricing, and unit pricing Promotion, which includes advertising, sales promotions, and personal selling, is regulated for deception, intrusion, and partial disclosure This includes truth in lending, truth in advertising, privacy protection, and the Do No Call Registry for telemarketing

Most regulation has been legislated to protect consumer rights as a consequence of marketing malpractice or market failures, such as redlining or subprime lending In addition, marketing regulation and policy issues have arisen from financial (e g , home mortgages) and physical (toys made in

China and salt in processed foods) crises as well as from negative press (e g , BP, Toyota) It has also arisen from consumer advocates and consumerism Peter Drucker very aptly observed that presence of consumerism is the shame of marketing (e g , Uslay, Morgan, and Sheth 2009)

With the growth of emerging markets comprising a large percentage of consumers below the poverty level, as well as the emergence of new brand-conscious middle-class consumers who are first-time buyers of everything from cell phones to television sets to automobiles and homes, marketing policy can, and must, take on three new roles to positively encourage and participate in shaping public policy (De Figueiredo 2010) I discuss these in the following subsections

From compliance to inclusive growth The first role is related to inclusive growth Historically, marketing has been driven by markets and financial outcomes This has resulted in neglect or abandonment of markets such as rural or disadvantaged urban consumers, especially for health, education, and lending (Anderson, Markides, and Kupp 2010) In turn, this neglect has resulted in the creation and coexistence of unorganized and exploitative marketers whose practices generate marketing's negative image (Garrett and Karnani 2010)

By definition, inclusive growth implies proactive inclusion of all consumers, not just those who can afford existing market prices As mentioned previously, Mahajan and Banga (2005) point out that 86% of the population in emerging markets has yet to experience the benefits of industrial innovations such as running water and electricity

There are four approaches to achieving inclusive growth The first is the deployment of corporate social responsibility initiatives specifically targeted at inclusive growth in areas such as consumer literacy, microfinancing, and social entrepreneurship A second approach is public–private partnership in which both the government and the private sector agree to pool resources and expertise to focus on the societal needs that free market processes and traditional marketing fail to address Led by the world agencies such as the World Bank, this public–private partnership model of serving the unserved markets on a sustainable long-term basis is an important area of research in marketing policy As mentioned previously, worldwide experiments in countries such as Mexico, Peru, India, and parts of Africa provide a large pool of data for research opportunities in marketing

A third, and more recent, approach to inclusive growth is large-scale investment by younger but wealthier NGOs, including the MacArthur Foundation and the Gates Foundation In addition, the Grameen Bank (microlending) in Bangladesh and Pratham (urban slums) and Jaipur Foot (prosthetics for polio victims) in India have demonstrated how low-cost innovation in products and distribution can achieve inclusive growth

Again, while the traditional successful marketing examples of packaging shampoo in single-serve units (Sachet) or repackaging Coca-Cola as a smaller serving to make them more affordable are useful, the real breakthrough and nontraditional concepts and practices seem to be with these newer NGOs Here, again, access to data for empirical research is likely to be less problematic

The fourth approach is market-based affordable products and business innovations Emerging markets are becoming hotbeds of innovation, according to a recent special report on innovation in emerging markets in *The Economist* (2010, p 3) "They are coming up with new products and services that are dramatically cheaper than their Western equivalents $3,000 cars, $300 computers, and $30 mobiles phones that provide nationwide service for just 2 cents a minute "

The Economist describes what it refers to as "charms of frugal innovation" by citing two examples First, there is a handheld electrocardiogram (ECG) called the Mac 400, invented in General Electric's laboratory in Bangalore (India), which it calls a masterpiece of simplification It also sells for $800 instead of $2,000 for a conventional ECG and has reduced the cost of an ECG test to just $1 per patient A second, equally exciting innovation is a low-tech device for water purification that uses rice husks (a waste product), innovated by Tata Consulting Services "It is not only robust and portable but also relatively cheap, giving a large family an abundant supply of bacteria-free water for an initial investment of about $24 and a recurring expense of about $4 for a new filter every few months Tata chemicals, which is making the device, is planning to produce over 1m next year and hopes for an eventual market of 100m" (*The Economist* 2010, p 6)

> P_7 A company's policy that is anchored to inclusive growth generates better financial performance in emerging markets than its free market process

From excessive to mindful consumption A second major area of concern (and research opportunity) is mindful consumption (Sheth, Sethia, and Srinivas 2010) With more than 4 billion consumers in the emerging markets, all aspiring to become first-time buyers and consumers of modern technological products, sustainability will become a key challenge for marketing and business As I point out in *Chindia Rising* (Sheth 2008), it is neither technology nor capital that will be the showstopper for the growth of China and India It will be the environment

The biggest consequence of the Industrial Revolution was the location divorce of production from consumption While it resulted in modern commerce and trade, which are the roots of marketing, it also generated more than 70% of the total carbon footprint from three basic areas of consumption processed foods, modern homes, and personal vehicles As mentioned previously, the first Industrial Revolution benefited only a small percentage of the world population If we add the size and rapid growth of the new middle class of emerging markets, it is likely to have both short- and long-term consequences for sustainability (Sheth and Parvatiyar 1995)

Current marketing practices that are friendly to the environment are conservation and green marketing Conservation is anchored to the three Rs of consumption reduce, reuse, and recycle Green marketing includes products that are less harmful to the environment, such as low-emission motor vehicles and energy-efficient appliances, homes, and factories However, these practices are not sustainable if marketing policy also embraces inclusive growth Unfortunately, with efficiency in producing and marketing of products and services and with the customer-centric accommodation of heterogeneous expectations, marketing has encouraged unnecessary purchasing and consumption by offering endless variety, 24/7 convenience, and aggressive sales promotions

In terms of policy, marketing may have to reduce choices and regulate consumption either voluntarily or by compliance through new regulations Just as we have worked to demarket smoking cigarettes and ban text messaging while driving, it will become increasingly necessary for marketing to be socially responsible in its own practices

A major area of marketing policy for sustainability is to encourage mindful consumption This includes developing a caring mind-set among consumers and customers—that is, caring for the self, caring for the community, and caring for the environment Similarly, marketing through policy can encourage moderation in product acquisition, replacement, and disposal It is well documented in medical research that the modern lifestyle and consumption habits have become self-destructive as well as harmful to the society and the environment From a policy perspective, it will be in the self-interest of marketing to inculcate and encourage mindful consumption This may require reinforcing consumers who are mindful of their consumption, using incentives and disincentives for reducing excessive and unnecessary consumption (especially of resources such as water, electricity, and gasoline), educating consumers about the consequences of their consumption, and partnering with policy makers to regulate consumption, as we have done with smoking and other mandatory deconsumption issues

> P_8 A firm's marketing policy anchored to mindful consumption generates better financial performance than free-market-based excessive consumption

From finance-driven to purpose-driven marketing A third area of marketing policy research is what I refer to as purpose-driven marketing Recently, many scholars have questioned the raison d'être of marketing Should marketing's purpose be limited to growth, profit, and market capitalization in creating and nurturing marketing assets such as brand equity and customer equity? It seems that marketing without purpose is likely to amplify mistrust of marketing and become a target of social criticism, especially with the growth of social media

Is it possible to fuse purpose into profit? Sisodia, Wolfe, and Sheth (2007) find that purpose-driven companies outperform the Standard & Poor's 500 stock market index by four times and exceed twice the financial performance of "Good to Great Companies" selected as financial role models by Jim Collins In other words, there is no trade-off between purpose and profit, contrary to popular and widespread belief

Purpose-driven marketing, along with inclusive growth and sustainable consumption, will become increasingly necessary as emerging markets migrate from the peripheral to the core of world markets Purpose-driven marketing will require three key changes in marketing policy and practice First, it will require extending marketing to a company's stakeholders (community, employees, channel partners, suppliers, and investors) and not just its customers The stakeholder perspective of marketing is likely to result in balancing diverse and sometimes conflicting goals and perceptions of different stakeholders It will mean developing marketing skills for employee branding as well as community branding and communication

A second area of research is related to developing purpose-driven brands While most brands are historically anchored to product attributes, and some have transcended to focus on customer benefits, how do we embed purpose and meaning in brands for customers and other stakeholders that go beyond product attributes and customer benefits? Do purpose-driven brands outperform other brands? Does a purpose-driven brand command a greater asset value than others? Is the lifetime value of purpose-driven brands greater than that of other brands?

A third aspect of purpose-driven marketing is to redefine the raison d'être of marketing as trustee and steward for each of its assets (branding and customers) In other words, how can marketing attract, nurture, and retain trust of customers, community, employees, and other stakeholders? What are marketing's roles and activities as brand steward for a company's products, services, and reputation?

> P_9 (a) Purpose-driven marketing delivers better financial performance than finance-driven marketing (b) Purpose-driven marketing generates greater brand and customer equity than finance-driven marketing (c) Purpose-driven marketing wins greater share of heart of customers than finance-driven marketing

Rethinking Marketing Practice

Marketing practice is partly driven by theory, partly by strategy, and partly by policy As described previously, there are four substantive areas of research related to international marketing (1) Why do products flourish here and fizzle there? (2) Should a company extend or adjust its marketing mix to suit the local markets? (3) Are there country-of-origin effects, especially in emerging markets in which image of an advanced country is often an advantage? (4) Can brands be global or should they be local or regional? This section focuses on how the rise of emerging markets will affect marketing practice, including redefining the role of the chief marketing officer and reorganizing the marketing function

From glocalization to fusion marketing The old debate of whether, when, and how to extend or adjust marketing mix based on local cultures and regulation is giving way as a result of more bilateral and regional free-trade agreements and globalization of competition Markets are less regulated than they were in the 1980s, especially after the abolition of the General Agreement on Tariffs and Trade, establishment of the World Trade Organization, and economic reforms in many emerging markets, such as Vietnam, Ghana, Ecuador, and of course the BRIC countries The growth of the Internet and new social media across national and cultural boundaries are further indicators of borderless markets enabling even freer flow of trade and investment This global village phenomenon has raised the academic debate about extension versus adjustment to another outcome—namely, the fusion of marketing practices between advanced and emerging markets

With the rise of China and India (Chindia), rather than a clash of cultures, there seems to be more of a fusion of the East and the West in cuisines, arts, literature, spirituality, music, and design Rudyard Kipling, who said "East is East and West is West and never the twain shall meet," is dead wrong He is not only dead, but he is wrong also[1]

Although we have studied the Westernization of emerging markets, we need to now research what I refer to as the Easternization of the world, especially with respect to fundamental beliefs about spirituality and values In other words, we need to develop a new psychographic inventory similar to values and lifestyles that can track this trend over time Because the Western cultures are prochange, the speed of Easternization is likely to be faster At the same time, the traditional notion of extension versus adjustment of marketing mix has to give way to a fusion of marketing practice, as symbolized by Christian yoga and integrated (holistic) medicine Using brain research, scientists are developing an understanding of how meditation brings about changes in the brain, a fusion of old tradition with contemporary science It would be fascinating to conduct research on a link between meditation and brand's emotional quotient using brain research methodology

There are at least three research issues emerging from fusion marketing First, how does fusion become a differential advantage in product innovation or marketing communication? For example, does fusion music, fusion food, or fusion beverages generate enhanced revenues or price premium or both? What is the return on marketing investment for fusion marketing? Does it generate extraordinary market value by developing unique intangible assets?

A second area of research is the use of fusion marketing to develop a Blue Ocean Strategy in what are otherwise highly mature and competitive markets In other words, does fusion marketing generate altogether new customers and markets (grow the total market)? It seems that marketing strategy for market share and share of wallet may be supplemented by altogether new growth as a metric to measure the impact of fusion marketing Finally, does fusion marketing transcend cultures and markets? In other words, is it a global phenomenon appealing to both the emerging and the advanced markets?

It should be noted that fusion marketing is distinctly different from retro, nostalgia, and heritage marketing At the same time, as a construct, it needs definition, dimensionality, and measurement, just as we have done with market orientation and relationship marketing

> P_{10} Fusion of cultures and values in marketing mix generates better financial performance than either extension or adjustment of marketing mix

From diffusion to democratization of innovation A major area of managerial marketing in creating a competitive advantage has been innovation and its successful diffusion on a global basis The classic examples are Marlboro cigarettes and McDonald's The contemporary examples are Microsoft, Apple, and Google Traditional research on innovation has focused on two areas diffusion of innovations and differential advantage through inventions, discovery, and design This has led to concepts of opinion leadership, adoption-diffusion models, and first-mover advantage (Kerin, Vardarajan, and Peterson 1992)

Innovation in emerging markets, however, seems to be focused on three new areas of research and understanding First, how does a firm make innovations more *affordable* through design, target costing, and licensing? This is of particular interest in drug discovery, medical instruments, appliances, and cars (e g , the Nano car by Tata Motors in India)

Most of the research in marketing has been on the acceptability of innovations, focused on quality, performance, or image We have examined criteria such as relative advantage, compatibility, communicability, and trialability of innovations We have also conducted significant research on perceived risk in adoption of innovations

In short, we have examined innovations from the perspective of market needs and wants but not from the perspective of resource constraints such as income, time, and expertise In emerging markets with a large percentage of the population below the official poverty level, affordable innovation is emerging as key to marketing practice

Note that affordability was a key driver in the early part of the last century in the United States Examples include the Model T car, Timex watches, Kodak cameras, and Coca-Cola, to cite just a few There are similar examples with synthetic fibers such as nylon and polyester in industrial raw materials These innovations democratized the product for the mass markets Similarly, the United States pioneered the idea of home mortgages to make homes more affordable, the financing of automobiles through banks, and the financing of appliances and home furniture through department store credit cards and layaway plans Indeed, the largest credit card for a long time was Sears, which has now been replaced with bank cards, such as Visa and MasterCard There may be lessons we can learn from this early history of making affordable innovations in the United States that may be relevant for emerging markets

Second, how do we develop products that are *accessible* through design, materials, and technology? The most dramatic examples are access to telephone service in remote parts of the world and the use of mobile phones for market transactions and marketing communications by reaching out to rural consumers, producers, and merchants As mobile phones become more and more capable and compatible with the Internet, the marketing divide between the base of the pyramid and rest of the market is likely to shrink The Internet is a rich medium, and it has universal reach It is a great equalizer between the haves and the have-nots with respect to asymmetry of information and market power

Access to products and services is also directly related to infrastructure, logistics, and supply chain With the exception of China, it is likely to take years, if not generations, to build modern infrastructure in rural markets of most emerging economies Therefore, improvisation and grassroots innovation may be better to reach the base-of-the-pyramid market As mentioned previously, several NGOs have learned how to provide health and education services in the most remote parts of emerging markets The real secret of success for Coca-Cola has been its distribution system, which delivers its products deep into the rural markets all over the world While market access may not be a glamorous area for research, it is critical to marketing success Indeed, it is often the real differential advantage for a company especially in emerging markets

A third area of marketing practice is *reverse innovation* As more companies shift their research-and-development centers to emerging markets to develop products using local talent with a focus on indigenous market-based innovations, it is likely that what succeeds in emerging markets may become global market opportunities This is already happening in the automotive, pharmaceutical, medical instruments, and life sciences industries as well as in appliances, consumer electronics, and personal computers Marketing of reverse innovation will be important to understand because it has the potential for nonlinear and disruptive market effects

In a recent article, Jeff Immelt, chairman and chief executive officer of General Electric, along with his coauthors (Immelt, Govindrajan, and Trimble 2009), explained why the company decided to invest $3 billion (this is equivalent to $12 billion if adjusted by purchasing power parity) in the next six years to create at least 100 health care innovations in emerging markets that would substantially lower costs, increase access, and improve quality The ECG portable machine discussed in *The Economist* (2010) special issue as well as a portable personal computer–based ultrasound machine that sells for as little as $15,000 are considered revolutionary not only for their small size, low price, and portability but also because they were developed in India and China, respectively, and are now being sold in the United States, where they are pioneering new uses for such machines General Electric calls this "reverse innovation" because it is the opposite of the glocalization approach that many industrial goods manufacturers based in rich countries have employed for decades With glocalization, companies develop great products at home and then distribute them worldwide, with some adaptations to local conditions The authors go on to state that "glocalization worked fine in an era when rich countries accounted for the vast majority of the market and other countries didn't offer much opportunity But those days are over, thanks to the rapid development of populous countries like China and India and the slowing growth of wealthy nations" (Immelt, Govindrajan, and Trimble 2009, p 3)

The low-cost reverse innovation is not just to expand the low-end market but also to preempt local competitors in those countries, the so-called emerging giants, from creating similar products and then using them to disrupt GE in rich countries

One place to incubate reverse innovation is the unorganized local bazaars The sheer diversity of market bazaars and behaviors with respect to pricing, distribution, and customer–supplier relationships is astounding Like the Galapagos Islands, we need to understand the market ecosystem and interdependence of different market species, probably through anthropological or odyssey research For example, the informal bazaar is a powerful place to fully understand relationship marketing anchored more to interdependence and not simply trust and commitment Contrary to our traditional thinking of "Think global, Act local," this suggests the reverse "Think local, Act global " Similar to the global success of Starbucks, a local practice or product may have the potential to become a global marketing opportunity

> P_{11} As emerging markets become core to a company's marketing strategy, low-cost, affordable products with scale advantage generate better financial performance than high-priced premium products

From country of origin to building the nation brand The country-of-origin advantage is historical and transcends modern concepts of branded products Indeed it goes back to pre-Christian era, beginning with Europeans trading silk with China through West Asia (the so-called silk route)

There are several new areas of research and hypotheses related to country-of-origin effects as a consequence of the rise of the emerging markets First, branding of a nation is not limited to adding reputation for its products and services Today, nation branding is equally important to attract tourism, talent, trade, and investment and for citizen relationship management With globalization, nations are competing for markets, resources, and geopolitical hegemony For example, there is the growing influence of China and, to a lesser extent, India in other emerging markets and especially in Africa and Latin America for both access to market and securing strategic resources (Sheth 2008) The soft power is becoming a key intangible brand asset for nations Brand ambassadors include a nation's diaspora (e g , Indian and Chinese people have settled all over the world) as well as its heritage in culture, arts, and entertainment

While soft power is a core construct in political science, it is almost nonexistent in marketing practice, even though products and services made in a given country or offered by a company headquartered in a given country have enormous positive or negative impact by association For example, products made by companies from the United States may be boycotted in markets in which Americans are not wanted and, at the same time, open up doors in other countries in which there are growing political, economic, and military partnerships This is best illustrated by the growth in trade and investment between India and the United States, which, at one time, had a somewhat acrimonious political and ideological relationship Conversely, the political relationship between China and the United States is becoming increasingly acrimonious, resulting in negative propaganda about each other This was most prevalent between the Soviet Union and the United States during the Cold War years As a consequence, Coca-Cola was not welcomed in the Soviet Union and many of the nonaligned nations, including India and Egypt, which became a competitive entry advantage for its archrival Pepsi There are similar case histories about cars, computers, and construction equipment marketers Research on soft power and the role of the government in opening markets for a nation's products and companies is a key area of potentially developing a good theory or perspective

A second area of research is the rise of nationalism in emerging markets in which a brand is loved and patronized in the local market because it has been globally successful against well-established incumbents Examples include LeNovo, Haier, and Huawei in China Similar examples include Tata, Mahindra & Mahindra, Wipro, and Infosys in India Indeed, this country-of-origin advantage for global enterprises in emerging markets is now going beyond the national shores to other emerging markets The love and admiration for native sons that are doing exceptionally well likely has an intangible value and competitive advantage, but we do not have good empirical research on this in marketing

A third area of research is a longitudinal study of how a nation's brand evolves over time We have great historical research on the rise and fall of great powers (Kennedy 1986), such as the Roman, Spanish, and British empires, although it has not been linked to country-of-origin effects in marketing In other words, what are the positive and negative effects on products and services of a nation as it goes through the cycle of being admired to being labeled as heritage or legacy? This has been the case for the British empire, many of the British brands endorsed by the royalty have become either heritage or legacy brands Similarly, with the rise of China, and to some extent India, and as was the case with the rise of Japan in the 1980s and Korea in the 1990s, what is the image of products and services made in the United States? Has the United States lost its preeminence as the best innovator country?

As second aspect of brand life cycle has to do with its evolution Historically, a brand with its patent-protected innovation would begin in a high-quality, high-priced (premium) position, then migrate to a value position, and finally into a price position This has been the case with Levi's in blue jeans and Maytag in appliances However, emerging-market enterprises seem to follow a reverse brand cycle For example, Honda started with the economical Honda Civic, moved up to Honda Accord, and then introduced Acura as its luxury brand Similarly, Toyota started with Corolla, moved up to Camry, and then successfully entered the luxury brand market through Lexus This is now happening with Korean companies, such as Hyundai in the automobile market and Samsung in the consumer electronics and cell phone markets It is also happening with Indian pharmaceuticals, starting with generic brands and then introducing proprietary brands The Indian software industry also began with Y2K legacy technology, moved up to IT services, and now aspires to do the same in the system integration business

P_{12} (a) The greater the soft power of a nation, the greater is the halo effect on its products and services (b) The greater the global success of an emerging market multinational, the greater is the affinity of its products and services in its domestic market

Implications for Research

The rise of emerging markets offers new research and theory opportunities As companies globalize their operations and presence, they generate worldwide data on their customers in both the business-to-business and business-to-consumer markets First, what we need is comparative empirical research on the actual behavior of customers using marketing analytics For example, do the consumers in emerging markets buy and use cell phones in different ways than consumers in advanced countries? If so, what are the contextual causes for these differences? It may not be differences in needs and wants as much as resource constraints, inadequate infrastructure, or unique distribution system For example, most emerging markets have prepaid cell phone services primarily because there is neither a credit-rating system nor a significant penetration of bank cards The areas of comparative research and developing customer insights from data analytics are practically limitless

A second area equally important is theory development A domain does not become a discipline without a well-developed and accepted theory As Yadav (2010) points out, marketing has a dearth of good theory, whether it is generated by context-driven discovery process or construct-based justification We need dimensionalization of markets into some fundamental invariant constructs that can become the basis for a good comparative theory While market heterogeneity is used for understanding demand diversity, it is still not a core construct in marketing Similarly, institutional governance of markets is another construct that may be powerful in developing a comparative theory of markets

A third area of research is marketing policy We need a comprehensive theory about role of marketing in society anchored to inclusive growth, sustainability, and purpose Marketing as an institution and discipline is likely to become a fish in the digital fishbowl, especially with the worldwide growth of social media Everyone can take stakeholding and amplify the negative perception of marketing as a practice and a discipline because of its inherent association with trading and selling A purpose-driven marketing approach will ensure that the discipline is perceived as a positive force for the society, comparable to medicine and engineering

A fourth area of research in marketing is the fusion of existing perspectives with alternative perspectives generated by the context In other words, how can we blend the old and the new in our theory development and strategy? For example, how do we blend industry structure economics with institutional economics, as Williamson has tried to do with a hybrid theory of markets and hierarchies? Similarly, how do we blend market orientation with market development and resource advantage with scarcity of resources? Of course, the low-hanging fruits are the comparative empirical research studies with access to global databases and marketing analytics

Implications for Practice

Probably the greatest impact of emerging markets will be on marketing practice, as discussed previously I suggest three areas First, and probably the most important, will be the redefinition of the role and the responsibility of the chief marketing officer The current mind-set and competencies are likely to become liabilities as emerging markets become core to a company's business The traditional colonial mind-set of perceived superiority of the marketing practices of advanced countries, and especially among marketing services companies, such as ad agencies, and market research companies, requires the most significant change As Immelt, Govindrajan, and Trimble (2009) point out, the glocal practice of innovation has run its course and needs to be complemented with or substituted by reverse innovation

A similar mind-set change has to do with brand life cycles The traditional view of inventing a technology, branding it, and initially offering it as a high-priced premium offering and eventually becoming a value brand needs to be replaced, starting with anchoring a brand to price position, elevating it to value position, and finally elevating it to the premium position This is not limited to the evolution of products and offerings but also applies to the evolution of nations

The competency of the chief marketing officer will also need to shift from a functional specialist to a deep generalist The marketing myopia of focusing on a single stakeholder—namely, the customer—must expand to stakeholder marketing, as Smith, Drumwright, and Gentile (2010) suggest in the recent special issue of *Journal of Public Policy & Marketing* In addition to competencies regarding products and promotion, the chief marketing officer will need competency with respect to corporate social responsibility and must learn to partner with NGOs and government led initiatives

A second area is redefining marketing practice from a business unit line function to a corporate staff function It will resemble a finance or human resources function, pervading all operations, jobs, and functions It will be like breathing air As a corporate staff function, it will be custodian of a company's marketing assets (customers and brands) and will have same integrity, equity, and compliance issues as in finance and human resources Indeed, at General Electric, this is being implemented with the direct mandate from the chief executive officer (Comstock, Gulati, and Liguori 2010) The latter two corporate functions are regulated by external agencies with public disclosure obligations While marketing is also regulated by external regulations, it has fewer disclosure obligations, both internally and externally Often, a company's marketing practices are treated as its trade secrets, and therefore companies are unwilling to disclose them publicly However, greater transparency and good governance are preventive measures against punitive damages assessed through lawsuits, as evidenced by experiences of the cigarette industry and the drug companies

A third area of marketing practice that emerging markets are likely to affect will be shortage of marketing talent The sheer size of China and India in consumer products and organized retailing will demand well-trained and competent marketing professionals Reliance Retailing, an emerging retailer in India, has estimated that it will need to recruit and train 300,000 retail sales professionals, ranging from floor salespeople to store managers, in less than ten years

At the same time, traditional places to recruit marketing professionals are incapable of generating such large numbers This will be comparable to what the IT industry experienced in India The industry had to reach out to nonengineering talent, such as science majors, and add new certification and training programs to make them competent in software and hardware In turn, this has also led to new training and certification companies, such as NIIT and Aptec

What will be needed, therefore, are sales and marketing certification programs that can transcend national boundaries, similar to cost accounting and financial planning Marketing as a practice is also likely to become more vocational, similar to law and medicine (including paralegal and paramedical talent)

Final Thoughts

The rise of emerging markets is not only inevitable, it will have a disruptive impact on marketing practice and theory as we know it today The sheer size of consumer markets in countries such as China and India, combined with their aspirations and entrepreneurship, will shift emerging markets from the periphery to the core of global competition, with home-field advantages going to multinationals from these emerging markets It is already happening across diverse industries, such as beer, steel, appliances, and cell phone services It will also happen in consumer electronics, automobiles, personal computers, and information and communication infrastructure industries

The marketing field needs to change from a colonial mind-set to a global mind-set In a thoughtful paper, Burgess and Steenkamp (2006) propose a four-stage process for this transformation theory development, acquisition of meaningful data, analysis of the data to test theories, and learning Research on emerging markets is not just a "nice thing to do", it is increasingly becoming a necessity This would entail encouraging doctoral students to go for internships in emerging markets and inviting future scholars from emerging markets to do postdoctoral research or inviting them as visiting professors Finally, it will require the editorial leadership of top-tier academic journals to make research on emerging markets mainstream publications

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George S. Day

Closing the Marketing Capabilities Gap

Marketers are being challenged by a deluge of data that is well beyond the capacity of their organizations to comprehend and use Their strategies are not keeping up with the disruptive effects of technology-empowered customers, the proliferation of media, channel, and customer contact points, or the possibilities for microsegmentation Closing the widening gap between the accelerating complexity of their markets and the limited ability of their organizations to respond demands new thinking about marketing capabilities Three adaptive capabilities are needed (1) Vigilant market learning that enhances deep market insights with an advance warning system to anticipate market changes and unmet needs, (2) adaptive market experimentation that continuously learns from experiments, and (3) open marketing that forges relationships with those at the forefront of new media and social networking technologies and mobilizes the skills of current partners The benefits of these adaptive capabilities will only be realized in organizations that are more resilient and free-flowing, with vigilant leadership and more adaptive business models

Keywords adaptive marketing capabilities, open marketing, data deluge, market orientation, digital marketing, strategic marketing, market learning

There is a widening gap between the accelerating complexity of markets and the capacity of most marketing organizations to comprehend and cope with this complexity The increasing demands on marketing organizations are leaving marketers and their firms vulnerable Most marketers would ruefully endorse this assertion and then acknowledge their uncertainty about how to navigate this reality The first objective of this article is to diagnose the growing gap between the demands of the market and the capacity of organizations, and especially the marketing function within organizations, to meet those demands and understand why the gap is widening The drivers are increasing complexity, interacting with an accelerating rate of change in markets and serious organizational impediments to responding The growing gap is unquestionably costing firms profitability now and competitiveness in the future

If the gap has become too wide to tolerate, what are companies doing to narrow their capability gap and possibly gain an advantage over slower-moving competitors? The second objective is to specify next practices for narrowing the gap and staying ahead of rivals This requires expanding the reach of marketing capabilities well beyond the narrow confines of the marketing mix These marketing capabilities are adaptive and enable the firm to adjust its strategies to fit fast-changing markets These new or enhanced capabilities add anticipatory and experimental dimensions to the market learning capability and introduce a capacity for "open" marketing that orchestrates the capabilities of network partners With these adaptive capabilities in place, the existing marketing capabilities also become more responsive to accelerating market changes

The forces behind the widening gap, and best sources of solutions, are found in the evolution of the Internet and the shrinking cost of communication The challenge for firms and marketers is to seize the opportunity for advantage out of the confusion created by accelerating market complexity Their ability to do so will shape the future role and influence of marketing within the organization

A Widening Gap

Anecdotal evidence of the rapidly increasing complexity of the market environment is persuasive The experience of the mobile phone market is illustrative (Court, French, and Knudsen 2006) Ten years ago, wireless carriers managed 3 demographic segments, now there are 20 need and value-based segments The number of offerings has proliferated into the hundreds, with diverse calling and messaging plans and telephones with a wide variety of capabilities—even the operating system of telephones has become a major differentiator The number of distribution channels has increased from three to more than ten, including company stores, shared and exclusive dealers, telemarketing agents, and affinity partners With tailored pricing plans, the number of price points exceeds 500,000 per firm

Sources of Complexity

Beyond this single industry example, the forces of market fragmentation and rapid change are everywhere Traditional communication vehicles are being augmented with social media, product placements, event marketing, and viral marketing Whereas marketers once had to exert significant

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effort to gain feedback from customers, now they struggle to keep up with floods of feedback coming from innumerable channels A whole industry has been born in the past few years to help firms track and understand what is being said about them, their products, and their competitors in user-generated content and social media channels An extreme example of this complexity comes from Nestlé's recent experience with an orchestrated campaign by Greenpeace to protest the company's purported use of palm oil from plantations in Indonesia that did not follow industry guidelines for protecting rainforests and orangutans By most traditional measures, Nestlé responded very well Within hours of Greenpeace launching the campaign, Nestlé responded by reiterating its commitment to sustainable sources of palm oil, suspended the supplier in question, and announced an audit of all of its palm oil suppliers However, a low-level marketing staffer overseeing Nestlé's Facebook page engaged in several ill-tempered electronic exchanges with users, which added fuel to the fire, gave the protest legs, and did even more damage to the brand

Variants on the same story of fragmenting market segments, proliferating digital media, and the rapidly growing number of customer touch points and channels are found in both business-to-business and business-to-consumer markets The best available evidence (Hagel, Brown, and Davidson 2009) is that changes in customer search and choice behavior, the proliferation of microsegments, the convergence of industries that intensifies competition, and the growing power of channels are gathering strength The fuel is the plummeting costs of bandwidth, storage, and computing as well as easier wireless connectivity, which has led to increasing use of digital and Internet technologies The convergence of these forces means that the amount of data collected by companies has turned from a rain shower into a deluge (*The Economist* 2010) The data are generated by systems for tracking costs, operations, customers, and sales in ever-finer detail, as well as newer digital sources like website visits, social network chatter, and public records available on the Internet These rich records from the immediate past are being enhanced with advanced analytics and predictive modeling to forecast likely outcomes When the relentless reduction in the cost of search is combined with similar cuts in the cost of distribution, the result is that many mass markets are becoming a mass of niches (Anderson 2006) Regardless of whether you agree with Anderson's contention that "the long tail" will account for a major share of revenue and profits, there is no denying that these niches represent an astonishing variety of potential opportunities for profit—that is, if the right ones can be identified and an appropriate model for delivering value and profiting can be implemented

The hypothesis that organizations are not keeping pace with market velocity and complexity is more difficult to test Suggestive evidence comes from several sources The first is the vast literature on information overload, which describes how an excess of information has resulted in the loss of the ability to make decisions, process information, and prioritize tasks (Eppler and Mengis 2004, Klingberg 2009, Meyer 1998) The second is the equally large literature on organizational adaptation in the face of environmental change (ranging from Miles and Snow [1978] to Hamel [2007])

Still, there is no longitudinal measure of the size of the gap Some evidence comes from recent estimates that the amount of data available expanded at an exponential rate from 100 billion gigabytes in 2005 to 1000 billion gigabytes in 2010 (IDC 2007) This suggests an even greater rate of growth than Davenport and Harris's (2007) claim that unique information per person is growing at 50% per year In contrast, they estimate that information consumption per person is only growing at 2% a year Taken together, a reasonable case can be made that the deluge of data has run up against the barrier of the limited ability of people and organizations to process it The evidence suggests that the volume of inbound data and the proliferation of channels is going to continue for the foreseeable future Absent any breakthroughs in human beings' ability to process data, unless new tools and approaches are adopted, the gap will continue to grow

Barriers to Adapting

There are other reasons to suggest that the gap is growing and that new approaches are needed to begin closing it During periods of technological disruption, most organizations have trouble keeping pace This is true of the effect of the Internet and cheap, ubiquitous communication technologies on the habits and behaviors of consumers and the creation of new business models for reaching these markets The tendencies toward inertia and sclerotic decision making are fed by lag effects and organizational rigidities

Organizational rigidities When an organization masters a capability, it is likely to keep doing it long past the point of obsolescence The mechanisms of preservation subvert exploration and impede innovation Why?

- *Path dependency and lock-in* A capability emerges from a series of path-dependent learning experiences (Liebowitz and Margulies 1994) Successful experiences are reinforcing and repeated, which eventually limits other possible approaches and, at the extreme, locks the organization into a dominant approach Other approaches are viewed with skepticism because they lack a track record
- *Inertia and complacency* For a process such as media selection to qualify as a capability, it must work in a reliable and replicable way in a variety of contexts This necessary condition gets in the way of adaptation to new circumstances Mastering the exploitation of an existing activity often crowds out the necessary sensing, experimentation, and exploration that is the essence of a dynamic capability (March 1991) At the extreme, a long period of success can blind the organization to discrepant signals that the capability no longer fits the market
- *Structural insularity* Aaker (2009) uses the silo as a metaphor for self-contained functional, country, or product groups with independent operations that lack the desire to share information or work with other silos Weak signals of the need for change revealed by competitive moves or emerging technologies may reach one silo but not be appreciated or shared further Aaker also argues that these silos inhibit the development of deep expertise in next-generation marketing capabilities No single silo can master the new skills and disciplines or afford to acquire them on its own There are scale economies to capability building Despite the benefit of specialization and focus, an organization with silos limits the

sort of cross-functional dialogue and learning that creates novel ideas, and thus slows adaptation

Lagging reactions How quickly is an organization willing and able to react to verifiable shifts in the market? Even if it can overcome the organizational rigidities, time is not on its side It takes time to absorb new information, interpret its meaning, and then mobilize a coalition to act Traditional decision processes are cautious and slow, so by the time a new marketing initiative is finally launched, the market has moved forward to a new state Meanwhile, the pace of technology has not slowed Any feedback from the initiative is behind the times and difficult to interpret

All these problems are exacerbated by an insufficient pipeline of high potential talent to fill the key positions Many skill sets such as expertise in social networking, deep customer analytics, digital media, and emerging market segments are in short supply (Ready and Conger 2007) The simple fact is, however, that even if talent were available, the marketing capabilities at most firms are not growing commensurate with the challenge It is little wonder, then, that the gap is growing

Diagnosing the Gap

Although recognizing the gap is an important step, simply identifying the problem gets us no closer to dealing with it To begin addressing the gap, we need to understand more deeply why it exists, what its makeup is, and how it can be quantified This insight then provides the basis for systematically addressing the gap The best way to understand and begin to close the gap is through the application of capabilities theories However, today's dominant capability theories—relying on dynamic capabilities—are insufficient to guide firms' efforts to close the gap Here, I survey the history of the capabilities approach to strategy and the evolution of dynamic capabilities theory and explain its limitations in the face of the capabilities gap

The Gap Between Environmental Demands and Organizational Capacity

Resource-based or capabilities theories presume that firms within an industry are heterogeneous with respect to the strategic resources they control Because these resources take a long time to develop, they are also difficult to duplicate, so heterogeneity can be a long lasting source of competitive advantage The "resource" base comprises assets, which are tangible and intangible endowments such as brands, facilities, intellectual property, and networks that can be valued and traded, and capabilities, which are the glue that brings these assets together and enables them to be deployed advantageously (Day 1994, Dierkx and Cool 1989) Because capabilities are deeply embedded in organizational processes and practice and use cumulative learning and tacit knowledge, they are difficult to copy or value This article focuses on marketing capabilities because these give the organization the means to adapt to market changes

The "fit" of these strategic resources with the environment both dictates the survival prospects of the firm and explains relative economic performance (Helfat 2007) We propose that resource heterogeneity is a meaningful common theme for comparing organizational capacity and environmental complexity The accelerating diversity of market demands on the organization for tailored programs, mass customization, multimedia optimization, and proliferating channels must be met with a set of capabilities appropriate to dealing with them The greater the mismatch between the increasingly granular and fluctuating demands of the market and the relatively immobile and homogeneous resources available to the firm, the greater the capability gap

Figure 1 provides an illustrative comparison of the divergence of the resources available to a firm versus what is needed to match or fit the accelerating complexity of the market This stylized portrayal could easily be extended to show the differences between rival firms in the size of their gap, or between the potential fit (assuming optimal management of capabilities) and the actual fit for each firm

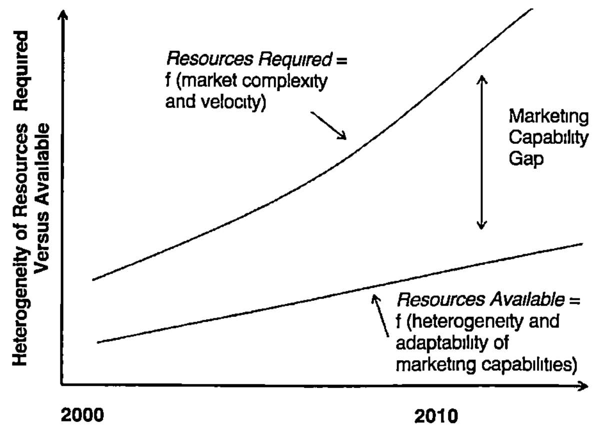
The capabilities approach to strategy locates the sources of a defensible competitive advantage in the distinctive, hard-to-duplicate resources the firm has developed The early static formulation of resources has evolved to become more dynamic but is still not sufficient to cope with contemporary market realities To make this case, we first dissect dynamic capabilities and then test them against the exploration versus exploitation framework

Dynamic Versus Static Capabilities

The original version of the resource-based view (Barney 1991 and Amit and Schoemaker 1993) offers an implicitly static portrayal of organizational capabilities as well-honed and difficult-to-copy routines for carrying out established processes There was no mechanism for explaining how capabilities were developed or how they adapted to market evolution or nonlinear disruptions such as the Internet (Makadok 2001, Schreyoegg and Kliesch-Eberl 2007, Teece and Shuen 1997) Dynamic capabilities theory was formulated to address this limitation

Both static and dynamic capabilities theories are attempts to explain sustainable differences in the performance of competitive firms Whereas competitive advantage can flow at a point in time from scarce capabilities,

FIGURE 1
The Marketing Capabilities Gap (Illustrative)



sustainable advantages require dynamic capabilities to create, adjust, and keep relevant the stock of capabilities Dynamic capabilities theory puts the spotlight on how an organization acquires and deploys its resources to better match the demands of the market environment A dynamic capability is "the capacity of an organization to purposefully create, extend, or modify the resource base" (Helfat 2007, p 5) These are the capabilities that enable organizational fitness (Winter 2005), as well as help shape the environment advantageously

The main functions of dynamic capabilities (Teece 2009) are (1) sensing environmental changes that could be threats or opportunities, by scanning, searching, and exploring across markets and technologies, (2) responding to the changes by combining and transforming available resources in new and different ways or adding new resources through partnerships or acquisition, and (3) selecting the organizational configuration and business model for delivering value to customers and then capturing the economic profit A dynamic capability is not an ad hoc solution to a problem but a repeatable and deeply embedded set of skills and knowledge exercised through a process It enables the firm to stay synchronized with market changes and ahead of competitors

Are Marketing Capabilities Dynamic?

Whether an organization can keep up with a high-velocity, complex market depends on having the right marketing capabilities But which marketing capabilities really matter? Indeed, what is the domain of marketing capabilities as a subset of all the capabilities of the firm?

The familiar capabilities of the marketing mix formulation are almost entirely static (Dutta, Zbaracki, and Bergen 2003, Vorhies and Morgan 2005) Thus, the new product development capability involves new products that exploit research and development investments but does not extend to imagining new ways for delivering customer value or reaching the market through new channels The standard processes for market strategy development and execution also have a static flavor (Vorhies and Morgan 2005) in that they emphasize segmentation, targeting, and the optimal allocation of marketing budgets Strategic market planning as often practiced is more likely to be an extended budgeting exercise within accepted market definitions than an imaginative rethinking of the business model and served market boundaries that prepares the business for alternative scenarios

The role of market orientation Can the capabilities for managing the marketing mix become more dynamic in a supportive organizational setting? Morgan, Vorhies, and Mason (2009) hypothesize that a market orientation has a liberating effect on capabilities, which makes the firm more dynamic They show that a market orientation—using a market information processing perspective (Hult and Ketchen 2005, Kohli and Jaworski 1990)—interacts strongly with marketing capabilities to enable the firm to better align its resource deployments with the market than rivals These authors infer alignment from a strong positive relationship of the interaction term with relative performance A suggested mechanism for the interactive effect is a reciprocal relationship whereby market insights are needed to build marketing capabilities and the exercise of the individual capabilities generates new market insights that enhance a firm's market orientation

The strategic domain of marketing capabilities The capabilities for implementing the marketing mix or the four Ps are inherently limited by their functional and tactical bias A strategic perspective on marketing as a C-suite responsibility broadens the domain to comprise the capabilities for creating customer value (Day and Moorman 2010) There are four elements to this perspective that are strategic imperatives for the organization

The first imperative is to be a customer value leader with a distinct and compelling customer value proposition This requires the disciplined choice of where the firm will stake a claim in the market, what value it will offer its target customers, and how the organization will deliver value that is superior to competition All firms must balance the short and long run A business strikes the right balance by maintaining its customer value leadership and then investing in a portfolio of innovations that will deliver results in the medium and long run The second imperative is to innovate new value for customers

Customer value and innovation benefit the firm when they are transformed into valuable customer and brand assets The third imperative is to capitalize on the customer as an asset This requires selecting and developing loyal customers, protecting them from competitive attacks, and then leveraging the asset beyond the core business Strong brands attract and retain customers and thus need to be explicitly managed The fourth imperative is to capitalize on the brand as an asset This means strengthening the brand with coherent investments, protecting it against dilution and erosion, and then leveraging it fully to capture new opportunities

This expansive view of marketing as a general management responsibility includes capabilities for managing customer service delivery, customer order fulfillment, sales integration, and the capitalization of the customer and brand assets These are capabilities that span multiple functions (Day 1994) Because they involve key connections with customers and channels, they are at the front lines of the ability of the firm to detect and adapt to changing market conditions

The superior execution of these strategic capabilities is enabled through deep market insights, which are essential to comprehending complex, diverse, and fast-changing markets These insights are nourished within market-driven organizations (Day 1994) These firms stand out in their ability to continuously sense and act on emerging trends and events in their markets In these firms, everyone from frontline salespeople to the chief executive officer is sensitized to listen to latent problems and opportunities They achieve this with market-driven leadership that shapes an open and inquisitive culture and a well-honed market learning capability that infuses the entire strategy process, including the creation and management of customer and brand assets

An information processing approach to market orientation that emphasizes the generation, dissemination, and responsiveness to market intelligence (Kohli and Jaworski 1990) is best suited to helping firms respond to fast-changing markets after clear signals have been received. Although market orientation and dynamic capabilities theories are powerful tools for helping firms navigate dynamic markets, they are simply not sufficient for what might be appropriately called the chaotic market environments today. Enhanced capabilities are needed for anticipating trends and events before they are fully apparent and then adapting effectively. This is what it takes to address the marketing capabilities gap.

A New Way of Thinking About the Necessary Capabilities

Dynamic capabilities theory is hampered by an inherent inside-out perspective, which begins with the firm and looks outward from that vantage point rather than starting with the market. A market orientation also has a liability. Although the starting point is the customer and opportunities for advantage, it is subtly susceptible to an exploitative mind-set in practice. This suggests two dimensions for thinking about capabilities: whether the orientation is from the inside-out or the outside-in and whether the function is primarily to exploit existing resources or to explore new possibilities. Crossing these two dimensions in Figure 2 reveals the need for a new class of adaptive capabilities.

Outside-in and inside-out. The essence of the resource-based view is that scarce, inimitable, and valuable resources exist to be used, and the task of management is to improve and fully exploit these resources (Makadok 2002). This leads to an emphasis on internal efficiency improvements and short-term cost reductions. As a starting point for strategic thinking, however, it myopically narrows and anchors the dialogue prematurely.

The dynamic capabilities approach is also susceptible to an implicit inside-out myopia. There is a recognition that sensing and scanning should emphasize the need to “define managerial traits, management systems, and organizational designs that will keep the organization alert to opportunities and threats, enable it to execute on new opportunities, and then constantly morph to stay on top” (Teece 2009, p. 206). However, these actions are initiated by mindful scanning activities mounted by the firm—akin to sending scouting parties into the field with a well-defined mandate. What gets lost is sensitivity to weak signals of impending changes and a willingness to experiment.

FIGURE 2
Adaptive Versus Dynamic Marketing Capabilities

Function ➡ Orientation	Exploiting	Exploring
Inside-out	Resource-based view of the firm	Dynamic capabilities
Outside-in	Capabilities of market-driven organizations	Adaptive marketing capabilities

In contrast, an outside-in approach to strategy begins with the market. The management team steps outside the boundaries and constraints of the company as it is and looks first to the market. How and why are customers changing? What new needs do they have? What can we do to solve their problems and help them make more money? What new competitors are lurking around the corner and how can we derail their efforts? This perspective expands the strategy dialogue and opens up a richer set of opportunities for competitive advantage and growth.

Jeff Bezos, the founder and chairman of Amazon.com, is a champion of the outside-in approach (Lyons 2010, p. 20). He explained how the company was able to meet the needs of its customers for web services by offering access to their cloud computing network and for a more convenient reading experience with Kindle. He describes it as a “working backward” mentality:

> Rather than ask what we are good at and what else can we do with that skill, you ask, who are our customers? What do they need? And then you say we're going to give that to them regardless of whether we have the skills to do so, and we will learn these skills no matter how long it takes. There is a tendency I think for executives to think that the right course of action is to stick to the knitting—stick with what you are good at. That may be a generally good rule, but the problem is the world changes out from under you if you are not constantly adding to your skill set.

Exploration and exploitation. March (1991) maintains that adaptive processes in an organization require balancing exploration of new possibilities (through experimentation, discovery, risk taking, and flexibility) and exploitation of old certainties. Inherent in exploitation is the quest for efficiency, replicability, and predictability of processes and routines. The requisite conformity and replicability is achieved with lean Six Sigma, reengineering, total quality management, continuous improvement, and aspirational benchmarking. Although both these processes are essential, they compete for scarce resources, with different time schedules in their payoff functions.

The original resource-based view was essentially exploitative. As Barney and Clark (2007, p. 259) note, “The assumption of much of the current theory is that the resources and capabilities that give a firm competitive advantage are relatively fixed in nature.” They further argue that, “ironically, even dynamic capabilities versions of resource-based theory are static in this sense. That is, the ability of dynamic capabilities to enable firms to develop new capabilities is also assumed to be fixed.” Nonetheless, dynamic capabilities clearly fall toward the exploratory end of the spectrum.

Both the original (Day 1994) and most subsequent formulations of the capabilities of market-driven organizations have emphasized the exploitative use of existing assets through the coordination of activities. They have overweighted the static attributes of capabilities in terms of their scarcity, immobility, and inimitability. The role of a market orientation was to shift the organization toward an explicit outside-in orientation by making market sensing and customer linking into distinctive capabilities.

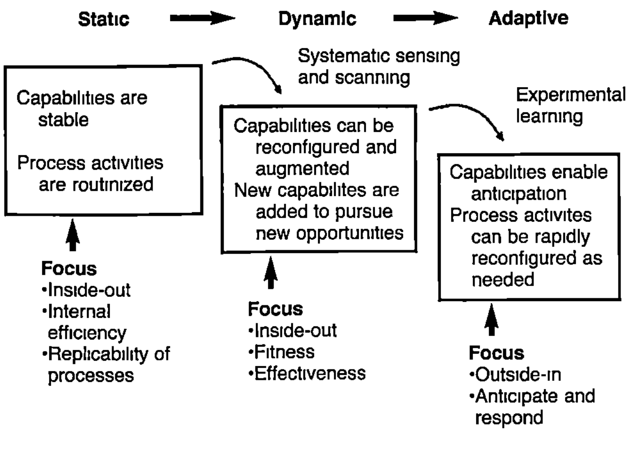
In retrospect, the market-driven approach to marketing capabilities was too hesitant about the exploratory side of the market learning process. Although this approach holds an effective market learning process to be more systematic and thoughtful, there was no built-in dynamic mechanism. Some of the ambivalence is evident in how the typical market learning process was initiated by a decision issue, which then launched a directed inquiry. The intentions were admirable, but any process initiated by an explicit inside-out question is inevitably constrained. Thus, market-driven approaches to capabilities are biased toward an exploitative mind-set.

The inside-out stance of the dynamic capabilities approach inevitably limits the ability of the firm to anticipate rapid market shifts and become more resilient in the face of increasing volatility and complexity. What are needed are adaptive capabilities that augment and extend the existing dynamic capabilities so that rapid adjustments can be made. The most salient distinctions between the three types of capabilities are highlighted in Figure 3. Most organizations will need all three types working together, but closing the marketing capabilities gap will require that more energy be devoted to building adaptive capabilities.

Adaptive Marketing Capabilities

The advance toward adaptive marketing capabilities is driven by necessity and enabled by technology advances. The accelerating velocity and complexity of markets demand enhanced marketing capabilities. Progress with analytical and knowledge-sharing technologies brings these new capabilities within reach. What new marketing capabilities will be needed? How will they be built? How will they help make the entire organization more adaptive?

FIGURE 3
From Static to Adaptive Capabilities


Static
Dynamic
Adaptive
Systematic sensing and scanning
Experimental learning
Capabilities are stable
Process activities are routinized
Capabilities can be reconfigured and augmented
New capabilites are added to pursue new opportunities
Capabilities enable anticipation
Process activites can be rapidly reconfigured as needed
Focus
•Inside-out
•Internal efficiency
•Replicability of processes
Focus
•Inside-out
•Fitness
•Effectiveness
Focus
•Outside-in
•Anticipate and respond

The remainder of this article draws on relevant theory and experiments by best-practices companies to propose three answers to the preceding questions. First, organizations need to acquire or enhance their adaptive marketing capabilities (vigilant market learning, adaptive experimentation, and "open" marketing that mobilizes dispersed and flexible partner resources). Second, these capabilities have greater leverage when they are used by an adaptive business model and housed in a supportive organization that has a robust market orientation and is structured to be aligned with the market. The essential enabler is vigilant leadership that acknowledges the need for adaptability and drives the capability-building process. Third, the familiar marketing-mix capabilities must become more dynamic and supportive of an adaptive strategy.

Vigilant Market Learning

How can an organization learn to make sense out of an increasingly volatile and unpredictable market? Two principles help shape an answer. The first comes from complexity theory, which demonstrates that all successfully adapting systems transform apparent noise into meaning faster than the apparent noise comes at them (Haeckel 1999). That is, they have cultivated a vigilant learning capability that helps them see sooner. Second, the behavior of the firm must shift from a reactive to a sense-and-respond approach. This means that decisions are driven by current customer requests and behavior and signals about their changing needs. These are familiar tenets of the information processing perspective on market orientation (Kohli and Jaworski 1990). In an era of accelerating complexity, however, deep customer insights must be enhanced with an early warning system and be amplified with emerging technologies for seeking patterns in micro data and sharing insights quickly.

The shape and texture of a capability with an ability to see sooner comes from the literature on organizational vigilance (Day and Schoemaker 2006, Fiol and O'Connor 2003, Levinthal and Rerup 2006). Vigilance is a heightened state of awareness, characterized by curiosity, alertness, and a willingness to act on partial information. Vigilant organizations are distinguished from their vulnerable followers by the following:

- A robust market orientation. This sensitizes them to making decisions from the outside-in.
- Knowing how to ask the right questions to identify what they don't know. This process is aided by scenario thinking to consider multiple possible futures, and a high tolerance for ambiguity.
- Surfacing the insights and overcoming organizational filters. When an organization is surprised by an event or late to comprehend a new pattern in consumer behavior, there is usually someone deep in the organization or the extended network of partners who was plugged into the future and had sensed the threat or opportunity. However, the decision makers didn't know they knew, and they didn't know that they needed to know.
- Defending against individual and organizational biases that inhibit real insight. While groupthink is particularly coercive, the tendency to jump to the most convenient conclusion and

then seek evidence that confirms the judgment distorts the picture Vigilant organizations work hard to bring together different perspectives on an issue to combat these tendencies

- Triangulating with multiple inquiry methods to clarify ambiguous signals and then probing deeply to learn more about promising patterns and signals

Vigilant market learning requires (1) a willingness to be immersed in the lives of current, prospective, and past customers and observe how they process data and respond to the social networking and social media space, without a preconceived point of view, (2) an open-minded approach to latent needs, and (3) an ability to sense and act on weak signals from the periphery It is the difference between testing copy versions with controlled experiments and continuously trolling the market for ideas, concepts, and formulations that are working or failing Market learning is not fully realized until the findings are accurately interpreted and adequately shared throughout the organization Both these requirements are problematic Managers may misinterpret what they see in favor of what they want to see or dismiss results that challenge the prevailing wisdom Product, country, and functional silos that are a consequence of decentralization impede the sharing of information and jeopardize marketing efforts

The same technology advances that spawn the data deluge that impedes understanding and sharing of insights can be used to strengthen the market learning capability Especially promising are advances in internal (social) networks that enable cross-company, regional, and functional sharing of the organization's market knowledge Many firms are reaching the point at which all their trend data, market data, and relevant studies can be found with a searchable "mini Google " Early insights into shifts in buying patterns or emerging microsegments are extracted with deep analytics Intelligent application of such technology tools will ready the organization to act ahead of rivals

Adaptive Market Experimentation

The adaptability of all learning processes is impeded when there is a limited repertoire of recognized patterns of customer behavior or strategic responses for responding to diversity and fragmentation Without an expansive map of the possibilities, it is difficult to properly appreciate new media such as mobile marketing or envision unusual microsegmentation approaches Unfortunately, high-velocity, complex markets also harbor a great deal of strategic dead ends Think of all the social marketing sites that cannot monetize their base but are valuable test-beds for learning faster what will work

The best answer is to invest in small experiments that can generate new insights—as long as there is a credible team available to interpret and share the learning Three conditions must be satisfied First, nurture an experimental mind-set This includes a willingness to challenge existing beliefs, such as how consumers can filter increasingly diverse sources of information of varying quality and still make decisions An essential ingredient is curiosity, which encourages the interrogation of the quasi-experiments in available streams of data to determine which initiatives have been successful or unsuccessful Second, codify and share insights and successful practices across the organization This is especially important for global firms such as Vodafone, Diageo, and Unilever serving diverse markets in which market structures and mobile and other communication methodologies are developing at different rates Third, in the spirit of increasing the variety of approaches, systemically tap a wider array of peer companies, precursors, and network partners to learn from their experience

The conduct of targeted experiments that can help firms navigate the increasing complexities of fragmenting markets is being aided by technological advances The familiar quasi-experimental approaches of rapid prototyping (Kelley 2001) and "probe and learn" market studies are being enhanced with new capabilities for conducting rigorous and statistically defensible experiments in which proposed charges are tried out on a small scale New software tools and advances in database management lead users through the experimental process, keep track of test and control groups, and extract the attributes that affect performances (Davenport 2009) Similarly, researchers are finding inventive ways to extract insights from web interactions With website morphing (Hauser et al 2009), the look and feel of a website can be adjusted to match the cognitive style of the visitor (e g , impulsive versus deliberate, visual versus verbal) These cognitive styles are inferred from clickstream data and offer new insights into emerging segments

Trial-and-error learning that relies on experimentation is quickly subverted if there is a "fear-of-failure" syndrome Organizations that reward people for playing it safe and hold the risk takers directly accountable for their mishaps soon discourage learning Although failures should be avoided if possible, they do have a therapeutic role because they contain valuable lessons It takes concerted leadership to create a more open climate in which learning from failures is possible and experimentation is a norm

Open Marketing

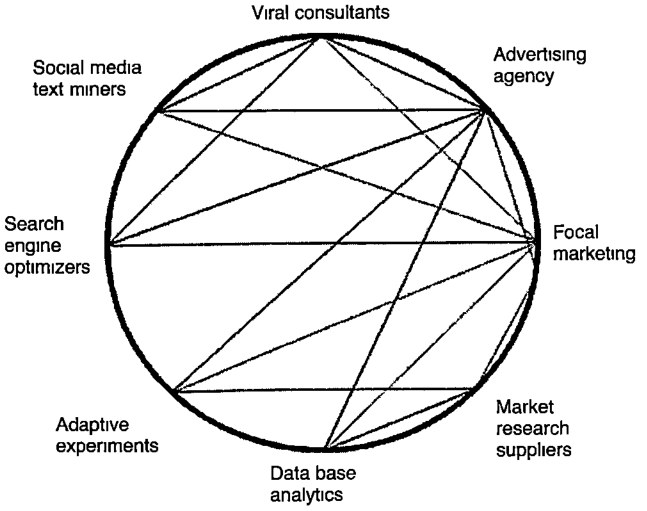
Networks are ubiquitous Consumers are connected through as many as 250,000 social networking sites (Van den Bulte and Wuyts 2007), companies are moving from supply chains to supply networks, and the focus of innovation is moving outside the firm to networks of partners Marketing scholars have identified a myriad of possible network structures (Achrol and Kotler 1999) With advances in knowledge sharing, coordination, and pattern recognition technologies, the vertical organization of siloes is being steadily unbundled (Kleindorfer and Wind 2009) This puts a premium on relational capabilities that extend the firm's resources beyond the firm boundaries and enable access to the resources of the partners (Dyer and Singh 1998)

Imagination and necessity will encourage initiatives to leverage networks and "open" up the marketing organization Not even Procter & Gamble has been able to master the proliferation of fast-moving choices in the new media environment In an ambitious experiment, the company is changing its lead agency to orchestrate several partner agencies with complementary skills, which in turn use multiple contractors The benefits to Procter & Gamble include the following (1) access to a far wider array of informed talent and new capabilities, (2) richer and more variegated, microlevel responses, and (3) an extended periphery that brings new insights back to the company Unlocking these benefits—while avoiding acute information overload—is increasingly possible as experience in deploying technologies is gained and experiments reveal what is likely to work

The interwoven nature of open marketing can be seen in the schematic portrayal of some of the partners to be orchestrated in the new media environment Figure 4 indicates that the focal marketing group is lodged within the marketing function of the firm, controls the budget, and is accountable for the results Although this "ball of yarn" schematic is dauntingly complex, the effective management of the network requires a new suite of marketing capabilities that will be difficult to learn and more difficult to copy—the prerequisites of a sustainable source of advantage Few firms will invest to build the necessary architecture and master the coordination, control, and sharing skills needed to act on the insights from their diverse partners while keeping the insights proprietary

A pivotal question—with an uncertain answer—is whether open marketing will be housed in a familiar self-contained, efficiency-centric, hierarchical model or a more open network structures (Day, Howland, and Parayre 2009) Proponents of the network organization (Gulati 2009) maintain that the traditional model is living on borrowed time and will be overwhelmed by the accelerating pace of change and fragmentation of the market The forces of inertia, embedded in legacy systems and mental models, will be too difficult to adjust This makes firms using a traditional model of organization vulnerable to networked competitors who are more nimble But will the open network model prevail? Advocates argue that it is more flexible and inherently more responsive to changing market requirements An open system allows for information flow across previously hard boundaries within and outside a firm Expertise can emerge from myriad sources If channeled or monitored effectively, these can offer tremendous power and insight to an organization Through a web of partners and collaborators, an open network provides access to a deeper set of resources and specialized skill sets than a closed model The possibilities are only beginning to be glimpsed through success stories such as Innocentive, Cisco, and Apple and will be greatly facilitated by advances in collaborative, knowledge-sharing technologies

FIGURE 4
Marketing in an Open Network



Offsetting the enthusiasm about open network organizations is the reality that more than half of all alliances and joint ventures disappoint (though the degree of disappointment depends on the prior experience of the partners in managing alliances) There are formidable control and coordination problems to overcome, including monitoring, accountability, and conflicts of interest The talent needed to manage these networks is still scarce For these reasons, some observers believe that networks will behave like many other management fads The first movers who have the right conditions and commitment grab the best partners and succeed, while the imitators fail and become discouraged

Adaptive Organizations

> If the rate of change inside an organization is less than the rate outside, the end is in sight Leaders must develop a sixth sense, an ability to see around the corner
>
> —Jack Welch (2005)

Those organizations best equipped to adapt to the volatility and complexity of their market will be more resilient, free-flowing, and less hidebound They will embrace just-in-time decision making, share key activities with network partners, and learn to profit from the greater uncertainty of the new market reality The ossified strategy process of long internal debates leading to detailed budgets and multiyear plans will be replaced by clarity and consistency in how to achieve customer value leadership and an emphasis on adaptive capabilities, structures, and processes Organizations can adapt to unprecedented change only when they can address it within a clear strategic framework Otherwise, they can only watch and react

Responding Adaptively

Organizations face difficult choices when deciding how to build a capacity for responding more adaptively A decentralized, "let a thousand flowers bloom" approach leads to the enthusiastic but uncoordinated pursuit of fast-moving and diverse opportunities The usual consequence is that complexity mushrooms, coordinating costs escalate, scale economies are dissipated, and the brand meaning is diluted

A more ambitious, clean-sheet approach, which aims simultaneously to maintain discipline while enabling adaptability, poses difficult implementation challenges The ostensible goal is to build an organization that can make timely adjustments to market shifts while ensuring consistency in pricing, branding, and resource allocation This admirable goal requires changes in the culture, the enabling business model, and skill sets, which may be beyond the reach of many management teams Even if they could make the transformation with the aid of advances in technology

(Court, French, and Knudsen 2006), there will still be uncertainty in the responses of customers and competitors to new marketing initiatives, which puts a premium on flexibility and complicates the allocation of resources and setting of goals, metrics, and incentives.

Valuing variety. Hamel and Välikangas (2003, p. 60) note that genetic variety "is nature's insurance policy against the unexpected. A high degree of biological diversity ensures that no matter what particular future unfolds there will be at least some organisms that are well suited to the new circumstances." This perspective sheds light on what organizations must do to become more adaptable in all their capabilities.

Every manager carries around in his or her head a set of biases, assumptions, and beliefs about how the market works, what customers want, and how these customers process information and make choices. These mental models help make sense of the environment, but when change is rapid, they stand in the way of deep understanding. The problem is exacerbated when everyone in the organization shares the same mind-set and responds in the same way. Systems and learning processes all reinforce certain perspectives and discount or exclude others. Thus, the first step to increasing adaptability is to diversify the talent pool with people that are not wedded to old and unquestioned assumptions. Outsiders or closely connected partners such as advertising agencies bring different life experiences and an openness to divergent information. Of course, there is always the risk that a resistant corporate DNA will reject those outside antibodies. But vigilant leaders recognize the value of diverse insights and keep them from being marginalized (Grove 1999).

Toward adaptive organizations. Relevant theory and the successful experience of next-practice companies point to three necessary conditions for organizations in which adaptive marketing capabilities are likely to flourish: (1) There is a vigilant leadership team, (2) the business model is responsive to fast-changing market signals, and (3) the organization structure is aligned to the market. Although each of these conditions could be the subject of a major treatise, the purpose here is to suggest what is needed in broad brush strokes. The relationship between the key elements is shown schematically in Figure 5.

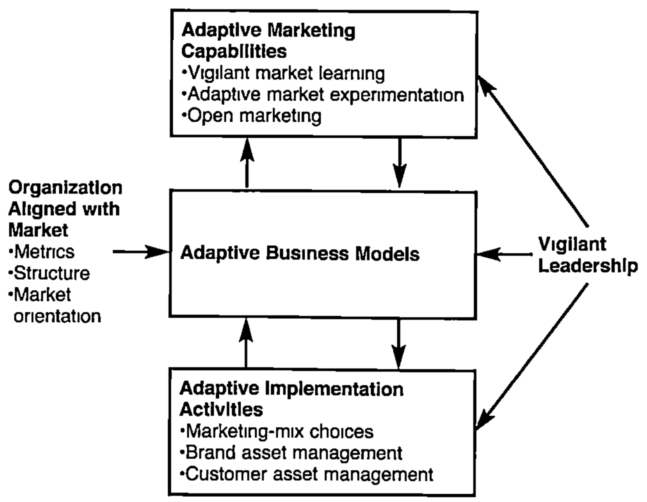
Vigilant Leadership

A vigilant leadership team nurtures a supportive climate for gathering, sharing, and acting on information from diverse sources. These teams are prepared to devote significant resources to monitoring and anticipating weak signals from the market periphery and create incentives to encourage the front line to keep them informed. The strategic thinking processes of these leaders are flexible and wide ranging (Day and Schoemaker 2006).

Three primary qualities distinguish vigilant leadership teams with an outside-in orientation from those that strive primarily for operational excellence and adopt an inside-out orientation:

- *External focus: openness to diverse perspectives.* The first leadership quality is a deep sense of curiosity and a focus beyond the immediate. These leaders tend to be more open, seek diverse inputs, and foster wide-ranging social and professional networks. In contrast, operational leaders are more focused, emphasize efficiency and productivity, and are more likely to limit their networks to familiar settings.

FIGURE 5
Implementing Adaptive Marketing Capabilities


Adaptive Marketing Capabilities
•Vigilant market learning
•Adaptive market experimentation
•Open marketing
Organization Aligned with Market
•Metrics
•Structure
•Market orientation
Adaptive Business Models
Vigilant Leadership
Adaptive Implementation Activities
•Marketing-mix choices
•Brand asset management
•Customer asset management

- *Strategic foresight: probing for second-order effects.* To achieve strategic foresight, vigilant leadership teams use a longer time horizon, employ a more flexible approach to strategy that incorporates diverse inputs, and apply tools such as scenario planning and dynamic monitoring.
- *Enabling exploration: creating a culture of discovery.* Enabling a creative culture is vital for encouraging vigilance and adaptability. This includes creating some slack so employees can explore outside their immediate job activities and encouraging adaptive experiments. Unfortunately, many cultures remain risk averse, with limited flexibility to explore widely.

Adaptive Business Models

A business model describes how a business *creates* the value it provides customers and then *captures* economic profits. It answers Peter Drucker's classic questions: Who is the customer? What does the customer value? What business are we in? It also answers the following fundamental questions: Which activities are performed by the business? What is the economic logic that explains how these activities deliver value to customers? How do we make money? Finally, it captures where and how the firm is embedded in an extended network of customers, suppliers, and partners.

The concept of business model was distorted and abused during the dot com era (Magretta 2002). Interest has been renewed as scholarly research demonstrates that interdependencies among organizational activities and processes have a bigger impact on performance than the activities and processes in isolation. Meanwhile, rapid advances in communications and information technologies are enabling new ways to speedily rearrange activities and engage partners (Zott and Amit 2008, 2009). Here are two examples of business model designs that offer potential to sharply improve adaptability to fast-changing market signals.

- *Sense and respond* The paragon of the sense-and-respond model is Zara, the pioneer of cheap chic fashions, whose "fast fashion" model enables it to move clothing designs from sketch pad to store rack in as little as two weeks (Linguiri 2005), in response to customer requests and behavior These organizations can modularize their activities and processes to create combinations that are responsive to a much wider spectrum of unpredictable customer requests In contrast, make-and-sell organizations adopt an inside-out stance and schedule their operations according to forecasts of likely demand (Haeckel 1999) The analogue for communication strategies is on-the-spot adjustments of messages and media in response to market signals versus the traditional media plan, which makes spending choices according to a fixed quarterly schedule
- *Flexible backbone* The flexible backbone is a hybrid approach providing low-cost support and messaging for some customers and deep collaboration and precise tailoring of offers for other customers (Court, French, and Knudsen 2006) It is built with a flexible cost-efficient backbone for common marketing, sales, and order fulfillment activities that all customers require, such as training, after-sales service, and warranties Adaptability is provided by front-end LEGO-like modules that are responsive to individual customer's requirements for augmentation, technical support, education, logistics and help with new product development A further step is the provision of rapid response solutions (Tuli, Kohli, and Bharadwaj 2007), derived from extensive online and/or face-to-face interactions with high-value customers Advances in systems integration, data analytics, and knowledge-sharing networks greatly facilitate the coordination issues

Aligning the Organization to the Market

Adaptive marketing capabilities are necessarily cross-functional Their effectiveness would be compromised if they were solely the province of marketing Instead, the role of marketing is to orchestrate the multiple outputs needed to understand the market and continuously deliver superior customer value The challenges are to (1) overcome the entrenched silos that impede a coherent view of the customer and slow decision making (Aaker 2009), (2) infuse the strategy dialogue with deep market insights that help comprehend the new market reality of accelerating complexity, and (3) ensure clear accountability for the total experience of the customer These are necessary conditions for outside-in strategies

The appropriate organizing principle for dissolving entrenched organizational boundaries is to align the organization around customers, rather than around products, channels, or brands (Day and Moorman 2010, Gulati 2009) Thus, L'Oréal Consumer Groups will sell L'Oréal Paris eye shadow to teens in Monoprix but offer working mothers a subscription for access to touch-up kiosks in gyms and washrooms in restaurants (Kemp 2009) A variety of transitional designs are feasible, ranging from cross-functional segment teams, to customer managers, to front-back hybrid models The prototypical outside-in organization with the requisite adaptability will operate as a porous entity held together by sophisticated knowledge-sharing networks and able to forge seamless partnerships with customers, suppliers and information resources—all in the service of a compelling customer value proposition

Adaptive Implementation Activities

In an adaptive enterprise, in which marketing activities are guided by vigilant learning, adaptive experimentation and open marketing, the familiar marketing mix will be taken to a new level of effectiveness This will not look like the product, place, price and promotion activities enshrined in decades of textbooks First, they will be dispersed across the partner network and will play a supportive role as befits their tactical status Second, they will be far better coordinated and actually deliver on the promise of being "mixed" to maximize their joint efforts Third, the practice of adaptive experimentation will reveal the effects of intricate combinations of marketing mix activities Armed with deeper insights, marketers will be better equipped to accept accountability for the impact of their actions on economic profit and the value of the customer and brand assets of the firm

Closing the Marketing Capabilities Gap

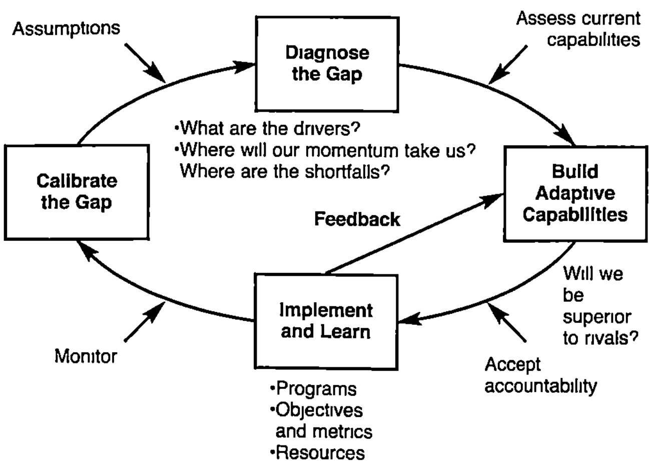
The marketing capabilities gap does not have to continue to widen at its present pace Next practice companies are learning how to become more vigilant and build adaptability into their marketing capabilities Companies are sharing these lessons among themselves in numerous industry forums, consulting firms are taking these insights and applying them in other situations, and academics are contributing by extracting patterns of success and failure and drawing generalizations

There will always be a sizable residual capabilities gap because events in markets are moving at Internet time, consumers are taking greater control, technology continues to advance, and the decision processes of even the most nimble companies cannot keep up However, should companies even aspire to close the capabilities gap? A more realistic and achievable goal is to close the gap faster than rivals Mastery of a set of mutually reinforcing adaptive marketing capabilities confers a sustainable first-mover advantage First, adaptive capabilities employ a great deal of difficult-to-copy tacit knowledge Second, they require clever investments in technologies and a willingness to open up the business model—all of which take time Aspiring emulators cannot skip the steps in the learning process Last, because they are moving down the learning curve ahead of rivals they can keep experimenting and extracting new insights that will help them stay ahead The purpose of this article is to chart a path for managers and suggest how researchers could undertake enquiries that will guide these managers with relevant insights

Implications for Managers

The process for developing more adaptive marketing capabilities depends on the size and source of the capabilities gap, the competitive situation, and the commitment of leadership to making the necessary changes Figure 6 presents the four steps in the process Many of the features are discussed in previous sections of this article, but three deserve elaboration First, there needs to be clear accountability for the end-to-end capabilities development process The tone and rationale needs to be set at the top An exemplar is

FIGURE 6
The Capability Development Process



Anne Mulcahy (2009), former chairman and chief executive officer of Xerox Corporation, who argues that to create personalized solutions for its data-intensive customers, Xerox needed to invent new market learning capabilities. In her view, market learning starts at the top: "The most important part of my job is listening to customers." The marketing organization has overall accountability for what is learned and how it is used. To keep the management team focused on the market, the top 500 Xerox accounts are assigned to senior officers, and each day, one of these officers is responsible for fixing customer problems.

The likelihood of a successful transformation of the marketing capabilities goes up sharply when the chief marketing officer takes direct accountability as a top-line leader (Aaker 2008; Landry, Tipping, and Kumar 2006; McGovern and Quelch 2004). These are senior and seasoned executives, widely respected inside and outside the firm, with full support of the chief executive officer. Their credibility is enhanced by the depth of talent in their marketing organization and their willingness to be held accountable for the return on investment of marketing spending. They have enough analytical prowess to hold their own with line managers and the chief financial officer. Indeed, the chief financial officer is often their ally. The C-suite has clarity about the strategic role and mission of marketing.

Second, this is a continuous learning process that requires clear objectives and relentless monitoring to determine whether the capabilities are improving and the gap is closing faster than the rivals. This is a significant problem, given how difficult it is for most companies to actually calibrate their capabilities gap. Rather than focus on the size of the gap per se, the emphasis should be on designing a dashboard of metrics that (1) looks backward to diagnose the gap, (2) looks forward to assess the payoff from different initiatives and reveal the rate of improvement, and (3) aligns the organization through incentives used to encourage and reward desired behavior. From the myriad of possible metrics the firm needs to select a small set for its dashboard that reflects its business and its ability to respond adaptively. Some should reveal what the target customers think and what they actually do, and others should reveal actual market performance. The key is to combine measures of ultimate success with intermediate diagnostic metrics that can be used to identify successes and problems.

Last, these general prescriptions need to be tailored carefully to the structure of the market and the firm's strategy. While all markets are subject to greater complexity at higher velocities—and surprises can always come from the periphery—the urgency of the response and the adaptive capabilities to be built or enhanced will differ depending on whether the firm serves mass markets with millions of customers or sells complex systems to a small number of valuable customers (Moore 2006).

Opportunities for Researchers

This article's analysis of the possible organizational responses to the Internet-induced forces of proliferation and complexity, compounded by increased velocity, raises important issues for scholars to consider. The following topics address how to improve the adaptability of marketing organizations.

Understanding the marketing capabilities gap. The notion of a gap between the accelerating demands of the market and the capacity of a marketing organization to comprehend and cope is appealing but speculative. Currently, a quantitative estimate of the size of the gap is out of reach. Nonetheless, much can be done to better understand how fast the demands of the market are expanding relative to the capacity to respond.

On the demand side of the gap, there has been a rapid proliferation of touch points connecting a firm with its customers. Which are most important? How are customers coping with this rich information environment? What coping strategies are they using, and how should firms take advantage of this behavior? Which markets are most susceptible? An understanding of these contingencies could shed light on when the capabilities gap is unacceptably large versus simply troubling.

On the response side of the gap, research is needed on the organizational impediments. What are the respective contributions of lock-in, inertia, coordination, and talent limitations? Previous research has regularly implicated organizational and database silos as impediments. How can useful market insights be rapidly extracted when databases cannot be linked because different functions use different platforms, partners cannot link databases, and the levels of aggregation are different?

Performance consequences of adaptive marketing capabilities. A significant question is whether firms that are adept at vigilant market learning, adaptive market experimentation, and open marketing will outperform their rivals. Answers to this question will require more precise conceptualization of these adaptive capabilities and an understanding of the main contingencies. Further research is also needed on the organizational context of adaptive marketing capabilities, notably the role of business models, vigilant leadership, and organizational alignment. A central presumption of our adaptive perspective is that the marketing mix or downstream view of the role of marketing in organizations has become overly static and tactical A further, untested proposition is that the capabilities for making and implementing marketing mix decisions will become more effective and timely when guided by adaptive marketing capabilities

An adaptive perspective on market orientation The concept of market orientation has served the field of marketing well After several decades of articulation, application, and research, the contributions to relative performance are well documented But this concept arose in a simpler and slower-paced era and should be rethought in light of the uncertainties and complexities of contemporary markets Is the marketing concept better suited to the exploitation of existing markets versus the exploration of emerging markets and volatile customer behavior? As markets (both financial and customer) are beset by turmoil, is a market orientation as presently construed adequate to cope with the greater uncertainty that puts a premium on adaptability?

Marketing capabilities in network organizations Marketing capabilities in network organizations was a compelling issue for the senior marketing managers who participated in an American Marketing Association (Day, Howland, and Parayre 2009) study of the future of marketing A key uncertainty in this scenario study was whether marketing activities would be performed in a modified hierarchical structure or network design that shrinks the organization down to the core capabilities and expands the periphery to encompass diverse network partners In a networked future agency, partners, development partners, marketing researchers, and every conceivable specialized skill set are part of the extended fabric This is outsourcing on a grand scale, with the intent of making every function more open and adaptable The field of open innovation has led the way with innovative business models (Chesbrough 2006) We need a complementary development of the concept of open marketing to showcase theoretical possibilities and next-generation marketing

Globalization and its complications The forces of proliferation, complexity, and accelerating velocity are playing out on a global tableau Multinational companies have the added challenge of drawing market insights from diverse geographic markets and responding when these markets have different levels of Internet penetration, access to media, and restrictions Their experience is that the best ideas come when pieces of knowledge from diverse geographies can interact and inform each other (Santos, Doz, and Williamson 2004) How do firms cope with this level of complexity while they struggle to close the marketing capability gap in their core markets? What is the optimal way to share experience of successes and failures and extract robust insights?

Summary

The familiar saying "Necessity is the mother of invention" holds valuable wisdom For marketers of all stripes, there is the pressing necessity to respond to the accelerating complexity of their markets which stresses their organizations and potentially places them at a competitive disadvantage There is a real and expanding gap between the demands of markets and the ability of firms to address the complexity and velocity of change in their markets

The inventions in response to this necessity for an adaptive response are more problematic Some firms will tinker at the margins of their marketing activities but otherwise continue with their tried-and-true practices Such a passive response ensures that their capabilities gap will widen, and they will function far below their potential It is likely to be an increasingly untenable position as more adroit competitors—or new entrants—exploit the developments in Internet and knowledge sharing technologies to gain an advantage They will demonstrate the value of microtargeting, building communities of users, and engaging in a dialogue with their customers to magnify the impact of their marketing activities These more vigilant competitors will see opportunities sooner and put in place the capabilities to respond to whatever direction this market moves

The field of marketing will raise its game when it moves beyond static marketing activities to adaptive capabilities that fit the new market reality This will build on insights from the experience of next practice companies, demand a willingness to rethink existing business models, and open up the organization to network partners We are confident that the disruptive shock to the system from the Internet era will spawn a new generation of insights into how markets work and how organizations can anticipate and respond to fast-moving market signals

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Gary L. Lilien

Bridging the Academic–Practitioner Divide in Marketing Decision Models

The marketing decision models field has produced many striking developments that have had a dramatic impact on practice. However, the field has produced orders of magnitude more developments that have received minimal use. In this article, the author notes the many successful marketing model developments but then considers the relatively low level of practical use (trial or adoption) and questions why that is the case. He then suggests how changes in the incentive and reward systems for marketing academics, marketing practitioners, and marketing intermediaries can bring about adoption and implementation improvements that would be mutually beneficial, bridging the academic–practitioner divide. The author also outlines a program of research in the area of the adoption and use of marketing decision models that will provide guidance on what to develop and how to get those developments adopted.

Keywords: decision models, marketing models, implementation, marketing practice, intermediaries

> The big problem with management science models is that managers practically never use them. There have been a few applications, of course, but the practice is a pallid picture of the promise. (Little 1970, p. B466)

Charles Dickens began his *Tale of Two Cities* with the line "It was the best of times, it was the worst of times." The opening quotation by John Little, which characterizes the divide between academic model developers in marketing and the practitioner audience those developments are aimed at, mirrors Dickens's dichotomy. That academic–practitioner divide also brings to mind the issue that C.P. Snow (1993) raised in a 1953 essay, in which he discussed the divide between science and literature, which he called the "Two Cultures," and his belief in the need for closer contact between them. To paraphrase Snow, we must humanize the scientist and simonize the humanist in the marketing profession for the profession to truly prosper—to bridge the academic–practitioner divide. As Hoch (2001) and others have pointed out, a combination of formal models and intuition outperforms either pure approach to marketing decisions.

This article is specifically grounded in the domain of marketing decision models and marketing decision support systems (MDSS), but I believe the observations hold more broadly. They are related to the divide between theory and practice in marketing, why this divide is unhealthy, and some things we might do to bridge it.

Since the time of Little's (1970) observation (noted in the opening quotation), we have built a formidable flotilla of marketing models and have documented the clear business impact of many of them. This article discusses what marketing decision models and MDSS are and the benefits that accrue from their appropriate use. There are many successes. It is a "glass-half-full" story. I then argue that Little's alliterative comment that "practice is a pallid picture of the promise" is as true today as it was then. I go on to discuss what we know about why that is so and what remains to be learned about the glass-half-empty part of the story.

Next, following Roberts, Kayande, and Stremersch (2009), I add a third "culture" to Snow's (1993) two—marketing intermediaries—and discuss their critical but poorly understood role in the marketing model development and implementation process. I argue that intermediaries serve a vital boundary-spanning role in this domain, and any progress in bridging the divide will require their full participation.

With that foundation, I suggest changes in culture, incentives, and actions that are required for marketing academics, marketing intermediaries, and marketing managers to work more closely together for joint gain. I then outline a research agenda in the domain of organizational impact of marketing models.

My goal is to focus on the opportunity cost of continuing on our current path and the relatively small changes needed for all three sets of stakeholders to benefit greatly. There is a positive-sum game here for all, but implementing the needed changes will require cooperation, mutual understanding, and courage.

Gary L. Lilien is Distinguished Research Professor of Management Science, Pennsylvania State University (e-mail: GLilien@psu.edu). This article emerges from decades of working in this domain. I am grateful to the many individuals who have helped the field grow and who have worried over the "divide" in the title. I must single out John Little, whose influence is evident throughout. Much of what is here reflects my long collaboration with Arvind Rangaswamy. I am also grateful to my doctoral student, Frank Germann, for his research support. The article has benefited enormously from insightful comments and conversations with Bernie Jaworski, Ujwal Kayande, Don Lehmann, John Roberts, and Lisa Schutz, all of whose excellent ideas and suggestions I have shamelessly claimed as my own (but they know better). I especially want to thank Ajay Kohli for including me in this *JM* 75th anniversary initiative and insisting that I live up to his vision.

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The Glass Half Full: Marketing Decision Models and Their Benefits

Marketing Decision Models

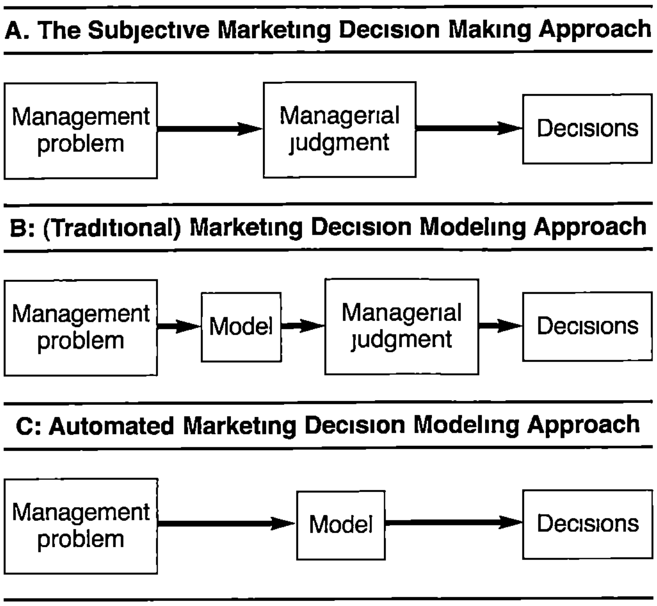
Marketing managers regularly make decisions about product features, prices, distribution options, sales compensation plans, and so on In making those decisions, managers choose from among alternative courses of action in a complex and uncertain world Like all decisions that people make, even when extensive data are available, marketing decision making involves judgment calls Most traditional marketing decision making, while sometimes guided by the concepts from our literature, is largely based on managers' mental models, intuition, and experience In many situations, such mental models, perhaps backed up by market research data, may be all that managers need to feel psychologically comfortable with their decisions However, mental models are prone to a range of systematic errors and biases (see, e g , Bazerman 1998)

Consider an alternative approach Managers might choose to build a spreadsheet decision model of the situation and explore the sales and profit consequences of alternative marketing programs before making a decision The systematic translation of data and knowledge (including judgment) into a tool that is used for decision support is what I call "(traditional) marketing decision modeling "[1] In contrast, relying solely on the mental model of the particular decision maker without using any support system is what I call "subjective marketing " A third option is to automate the decision process Consider a different context When a user logs on to Amazon com, the user is often greeted by a recommendation produced in the background based on a model and analysis of what Amazon com knows about that user's demographics and past purchase behavior, as well as the purchases of other people who have made similar purchases

I define (traditional) marketing decision modeling as a systematic approach to harness data and knowledge to drive marketing decision making and implementation through a technology-enabled and model-supported interactive decision process When human judgment or interaction is not involved (i e , when the marketing decision is automated), I call that automated marketing decision modeling Exhibit 1 sketches the differences

The marketing decision modeling approach relies on the design and construction of decision models and implementing such decision models within organizations in the form of MDSS As Wierenga, Van Bruggen, and Staelin (1999) point out, technological and modeling advances have greatly increased the availability and quality of model-based MDSS, a term that is somewhat broader than marketing decision modeling Many MDSS—for example, database marketing systems, customer relationship management systems, marketing dashboards, pricing DSS, and sales territory alignment systems—are based on marketing decision models and have been shown to improve the objective quality of marketing decision making (e g , Divakar, Ratchford, and Shankar 2005, Eliashberg et al 2000, Hoch and Schkade 1996, Lodish et al 1988, McIntyre 1982, Silva-Risso, Bucklin, and Morrison 1999, Zoltners and Sinha 2005), leading to improved managerial and organizational performance

EXHIBIT 1
Three Approaches to Marketing Decision Modeling That Differ by the Relative Role of Models and Managerial Judgment in the Decision Process


A. The Subjective Marketing Decision Making Approach
B: (Traditional) Marketing Decision Modeling Approach
C: Automated Marketing Decision Modeling Approach

The Benefits of Marketing Decision Models

The number of concepts, tools, and techniques underlying the marketing decision model approach is large The academic world has been producing a great deal of literature on quantitative marketing methods, much of which focuses on marketing decision making Lehmann (2005) cites the emergence of seven quantitative marketing journals since 1982 (when *Marketing Science* was founded), before which the field boasted only four In addition, several of these journals have increased the number of issues and the number of pages per issue It is fair to speculate that the rate at which marketing decision modeling knowledge and tools are being produced and reported in the academic literature has likely more than tripled in the past 25 years

The marketing decision models reported in the literature provide a range of benefits, detailed in the following subsections

Improve consistency of decisions Models help managers make more consistent decisions, and consistency is especially desirable in decisions that managers make often Russo and Schoemaker (1989) cite several studies that document the value of consistency in improving predictions (see Exhibit 2) A comparison of Column 2 in Exhibit 2 ("Subjective Decision Model") with Column 1 ("Mental Model") suggests that the formalized intuition of experts

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[1] Much of the discussion in this section is drawn from Lilien and Rangaswamy (2008), in which we use the term "marketing engineering" to refer to what I call here "marketing decision modeling "

EXHIBIT 2
Degree of Correlation with the True Outcomes of Three Types of Models, Showing That Even Subjective Decision Models Are Superior to Mental Models, but Formal, Objective Models Do Far Better

Types of Judgments Experts Had to Make	Mental Model[a]	Subjective Decision Model[b]	Objective Decision Model[c]
Academic performance of graduate students	19	25	54
Life expectancy of cancer patients	– 01	13	35
Changes in stock prices	23	29	80
Mental illness using personality tests	28	31	46
Grades and attitudes in psychology course	48	56	62
Business failures using financial ratios	50	53	67
Students' ratings of teaching effectiveness	35	56	91
Performance of life insurance salesman	13	14	43
IQ scores using Rorschach tests	47	51	54
Mean(across many studies)	33	39	64

[a] Outcomes directly predicted by experts
[b] Subjective Decision Model Outcomes predicted by subjective linear regression model, formalizing past predictions made by experts
[c] Objective Decision Model Linear model developed directly from data
Source Russo and Schoemaker (1989, p 137)

captured in a simple linear decision model outperforms the experts themselves On average, prediction accuracy improved from 33% correlation with the actual result to 39% correlation An explanation for this improvement is that people are inconsistent decision makers, whereas models consistently apply the knowledge of experts in new cases

Column 3 in Exhibit 2 shows the accuracy of an "objective" linear regression model, which has a 64% correlation on average with the true value What conclusion can be drawn? First, when managers can build an objective model based on actual data, they will generally make the best predictions However, in many decision situations, there are no data that show the accuracy or the consequences of past decisions made in the same context In such cases, the next best option is to codify the unaided mental model that decision makers use into a formal decision model However, on average, all three types of models have a positive correlation with the truth, whereas a model with random predictions would have zero correlation with the truth Thus, managers clearly bring expertise to the decision-making arena, but consistency in decision making is important, and models help induce consistency

Enable exploration of more decision options In some situations, the number of options available to decision makers is so large that it would be physically impossible for decision makers to apply mental models to evaluate each option Managers may develop decision heuristics that help prune the number of options to be evaluated, but such pruning may lead to poorer decisions than considering each available option more carefully An alternative approach is to develop a computer decision model, unconstrained by the manager's past behavior, that facilitates the exploration of more options By exploring more options, managers are more likely to move away from their prior dispositions (anchor points) and make better decisions For example, several sales force allocation models have resulted in a 5%–10% improvement in profitability as a result of reallocating effort with no additional investments (Fudge and Lodish 1977, Rangaswamy, Sinha, and Zoltners 1990, Sinha and Zoltners 2001)

Assess the relative impact of decision variables In some situations, the decision options may be few, but the variables that affect the decision may be numerous For example, in test marketing a new product, a manager may be considering only two decision options—withdraw the product or introduce it in selected markets—but many variables may influence this decision Variables such as competitor and dealer reactions, consumer trial rates, competitive promotions, the brand equity associated with the brand name, and the availability of the product on the shelf all influence product sales In this case, a decision model could provide the manager with a framework to more fully explore each decision option and to understand the impact of each of the variables on product sales Models that permit such exploration, such as Assessor, have been successfully used in test marketing, and Urban and Katz (1983) report that, on average, the use of the Assessor model offers a 6 1 benefit cost ratio

Facilitate group decision making Marketing decision modeling provides focus and objectivity to group decision making by externalizing the ideas and relationships that reside in the minds of decision makers In the same way that an explicit agenda helps direct meetings, the model or the results from a modeling effort can help a group deliberate and converge on a decision For example, discussions on allocating resources tend to degenerate into turf battles, like congressional budget debates However, if the entire group participates in a decision modeling exercise, group discussions can be directed toward why someone prefers a particular allocation rather than focusing simply on what allocation that person prefers

Update mental models of decision makers Marketing managers have mental models of how their markets operate They develop these models through trial and error over years of experience, and these mental models serve as valuable guides in decision making However, in forming these mental models, they may not take advantage of how managers in other industries have approached similar problems, or they may not incorporate academic research that addresses such problems When managers are exposed to decision models, they reexamine their own internal mental models, causing them to codify their thought processes and test their validity, formal models require that key assumptions be made explicit, and the model structure may require new ways of thinking about a familiar problem

These benefits summarized previously, along with others, have been realized in several well-documented applications using a range of marketing decision models over the years The Appendix provides a sample that shows the range of methods and benefits The first four examples were either winners of or finalists in the prestigious INFORMS Edelman Prize competition, honoring the best global applications of operations research modeling worldwide in any discipline, the latter five were winners of or finalists in the INFORMS Society for Marketing Science (ISMS) Practice Prize Competition (since 2009, this award has been run jointly with the Marketing Science Institute [MSI]), honoring marketing modeling applications that demonstrate academic rigor and have also demonstrated significant organizational impact [2]

In a special issue of *International Journal for Research in Marketing* (*IJRM*) dedicated to marketing decision models, Leeflang and Wittink (2000, p 105) cite the time from 1985 to the (then-) present as the era "when models are increasingly being implemented and there is interest in decision support systems We also see an increase in the routinized model applications that result in meta-analyses and studies of the generalizability of results " The domains of application that they cite are model automation, repetitive pricing and promotion decisions, media allocation decisions, distribution programs, product assortment and shelf space allocations, and direct mail solicitations

These studies suggest that the field has been producing highly impactful applications for a long time, several of which report modeling approaches that can be employed widely Roberts, Kayande, and Stremersch (2009) provide extensive empirical evidence of the broad impact of marketing decision modeling on practice at both the conceptual and the operational levels These developments are good news indeed, and the marketing decision modeling glass is at least half full

The Glass Half Empty: Limited Applications and Missed Opportunities

As impressive as the reported marketing decision model applications are, the mere availability, or even the use, of a marketing decision model to support decision making, does not guarantee better decisions or the realization of increased value for the firm Although models can produce significant benefits, many managers are reluctant to use models based on their objective quality For example, retail industry analysts report that retailers have been slow to adopt pricing decision models that are known to improve retail performance (Reda 2002) [3] Sullivan (2005) reports that only 5%–6% of retailers use price optimization models, while most prefer to use their instincts for making pricing decisions As a consequence, "actual retail prices observed over time may differ greatly from model-recommended courses of action" (Nijs, Srinivasan, and Pauwels 2007) Indeed, according to an Accenture (2002) study, while the Global *Fortune* 1000 firms spend more than $1 trillion in marketing, 68% of respondents could not even articulate what was meant by return on marketing investment in their organization, much less measure it

In the same issue of *IJRM* that carried Leeflang and Wittink's (2000) optimistic report, there are dissenters As Winer (2000, p 143) reports,

> My contacts in consumer products firms, banks, advertising agencies and other large firms say that models are not used much internally Personal experience with member firms of the Marketing Science Institute indicates the same I have not seen the penetration of marketing modeling to which the authors refer

Roberts (2000, p 130) concurs, noting that Leeflang and Wittink focus on the supply side (the models being built) rather than on the demand side (those actually used) He asks,

> What is it about conjoint analysis, customer satisfaction models and discriminant-based segmentation approaches that has led to their managerial adoption while in relative terms diffusion models, game theoretic competitive analysis and multi-equation econometric models have languished in the hands of the manager?

Van Bruggen and Wierenga (2001) study the impact of the most well-known marketing models reported in the academic literature They used the model developers as key informants to assess the long-term impact of those models Their results appear in Exhibit 3 At first glance, the numbers look good The impact, implementation success, and user satisfaction all score just below 5 5 on a seven-point scale But consider this These are our (academically) most well-known, most widely cited models And the model developers are the informants Both the sample and the informants are skewed in the direction of giving an upper bound on model implementation and impact success, and yet the models still rate below 5 5 on a seven-point scale

Little's (1970, p B483) prescription for the lack of managerial use focuses on the characteristics of the model,

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[2] A list of Edelman Prize Winners can be found at http //www informs org/index php?c=401&kat=Franz+Edelman+Award, associated papers can be found in the first issue of each year in *Interfaces* ISMS Practice Prize winners and finalists can be found in *Marketing Science* 2004, No 2, 2005, No 3, 2007, No 4, 2008, No 4, and 2009, No 4 DVDs are available of the finalist presentations at http //www informs org/site/ISMS_DVD/index php?c=5&kat=DVD+Details

[3] The reluctance of decision makers to use decision models even when those models can improve performance is not restricted to marketing For example, DSS significantly improve a doctor's clinical performance in prescribing decisions (Hunt et al 1998), yet medical professionals are largely unwilling to use such DSS (Lapointe and Rivard 2006, Sintchenko et al 2004)

EXHIBIT 3
Measures of the Impact of the Most Visible Marketing Models, Showing That There Is Still Room for Improvement

Impact Measures	M (SD)
Number of companies that implemented the MMSS (range: 0–333)	46.3 (79.3)
Percentage of companies that still use the MMSS (range: 0–100)	44.3 (42.2)
Impact of MMSS on actual decisions^a ("small/large")	5.40 (1.33)
Success of implementation of MMSS^a ("not successful/very successful")	5.43 (1.19)
Satisfaction of users^a ("not satisfied/very satisfied")	5.47 (1.07)
Impact scale (Cronbach's α = .80)	

[a]For these indicators, seven-point scale items were applied.
Source: Van Bruggen and Wierenga (2001).
Notes: MMSS = marketing management support system.

his well-known decision calculus criteria: Is the model (1) simple, (2) robust, (3) easy to control, (4) adaptive, (5) complete on important issues, and (6) easy to communicate with? He notes that "managers have to learn to use the model" and "a model is a stone in the shoe of better data," meaning that models identify the knowns, the unknowns, and the resulting data needs (hard and soft). Three decades later, Little (2004, p. 1858) reflected on what had changed and what had not since his 1970 paper; he noted that while technology, data, and methodologies had changed dramatically, two things that had not changed were "organizational inertia and academic promotion criteria." He quotes correspondence with Marshall Fisher:

> Models can be deployed in one of two ways—either fully automated untouched by human hands or as a decision support system under the direction of a manager.... In the second mode, I have found that simple beats complex optimization every time because it enables a better coupling with the heavily involved manager.... most of my failures have come from trying to deploy sophisticated, black box optimization models in DSS environments because the managers with responsibility were unwilling to implement recommendations they did not understand. (Little 2004, pp. 1857–58)

Fisher implies that most of his successes implementing sophisticated decision models have been of the automated variety, and his failures have been organizational rather than technical in nature. Lodish (2001, p. S54) describes his lessons from 30+ (very successful) years of building and applying models:

> The criterion for a good, productive model is not whether it is theoretically or empirically perfect. It is whether the manager's decision, based on the model, improves productivity enough to justify the costs and resources devoted to developing and using the model.... This orientation has made it difficult to get some model descriptions into the best academic journals. However, I consider practical applications to be one of the most important attributes of my academic work.

Good for Len but bad for our field. Why should marketing academics be forced to make such trade-offs?

About a decade after his 1970 paper, Little (1979) figured out that good marketing decision models were not enough; they had to be embedded in MDSS that included those models, in addition to data, analytic tools, and computing power. Work on MDSS has followed, but that area of research has not become mainstream in the marketing literature, a point to which I return.

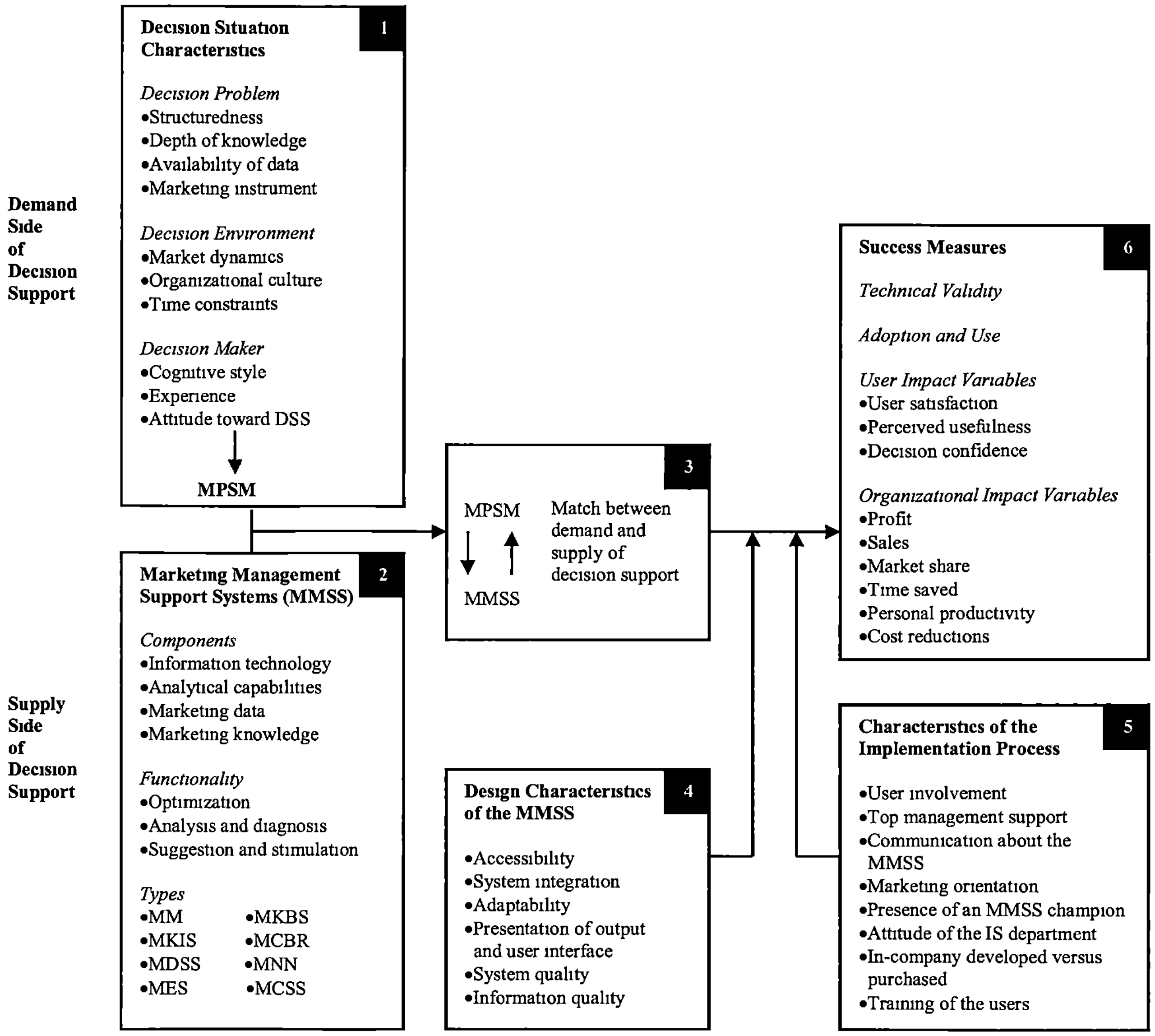
Wierenga and Van Bruggen (1997, 2000) argue that decision aids for marketing managers should match the thinking and reasoning processes of the decision makers who use them. They discuss different marketing problem-solving modes and aver that there is no such thing as a single best MDSS. Zinkhan, Joachimsthaler, and Kinnear (1987) concur and find that risk aversion, involvement, cognitive differentiation, and age predict MDSS utilization and satisfaction. (I argued such a case in a more superficial manner decades earlier [Lilien 1975] and called the idea "model relativism." The term never gained traction.)

Arvind Rangaswamy and I summarize elsewhere (Lilien and Rangaswamy 2004) several reasons for this lack of adoption, including that (1) mental models are often good enough (particularly in predictable environments [Hoch and Schkade 1996]), (2) models do not solve problems, people do (so there will always be a human component, at least in marketing decision modeling environments), (3) managers do not observe the opportunity costs of their decisions, so they cannot see what the upside of a decision model might be, and (4) models require precision and analysis, while managers often prefer ambiguity and intuition.

Some of my colleagues have suggested the application of Rogers's (2003) diffusion of innovation factors to explain the gap between potential and realized implementation: perceived advantage or benefit, riskiness of purchase, ease of product use/complexity of the product, immediacy of benefit, observability, trialability, price, extent of behavioral changes required, and return on investment. The trialability issue is one that Urban and Karash (1971) pointed out decades ago, when discussing an evolutionary approach to model building; their observations are as relevant today as they were then.

Most of these issues are incorporated implicitly or explicitly in Wierenga, Van Bruggen, and Staelin's (1999) framework for determining the success of MDSS, which can also be applied to marketing decision models (see Exhibit 4). These factors involve (1) demand-side issues, which involve characteristics of the decision problem, the specific decision maker, and the organizational environment in which the decision takes place, matched with (2) supply-side issues, or characteristics of the system, including the data, the knowledge base, and the analytics or other underlying technology, (3) design characteristics of the MDSS itself, (4) the implementation process, including characteristics and attitudes of the adopting organization and the process used by the system developers, and (5) success measures, including attitudes toward the system, stakeholder success measures, and organizational success measures, both financial and otherwise. The extensive set of factors in their framework, along with the many drivers in Rogers's adoption criteria, suggests that there are many potholes on the road to the successful implementation and use of marketing decision models.

EXHIBIT 4
An Integrating Framework of Factors That Determine the Success of Marketing Management Support Systems



Source Wierenga, Van Bruggen, and Staelin (1999)

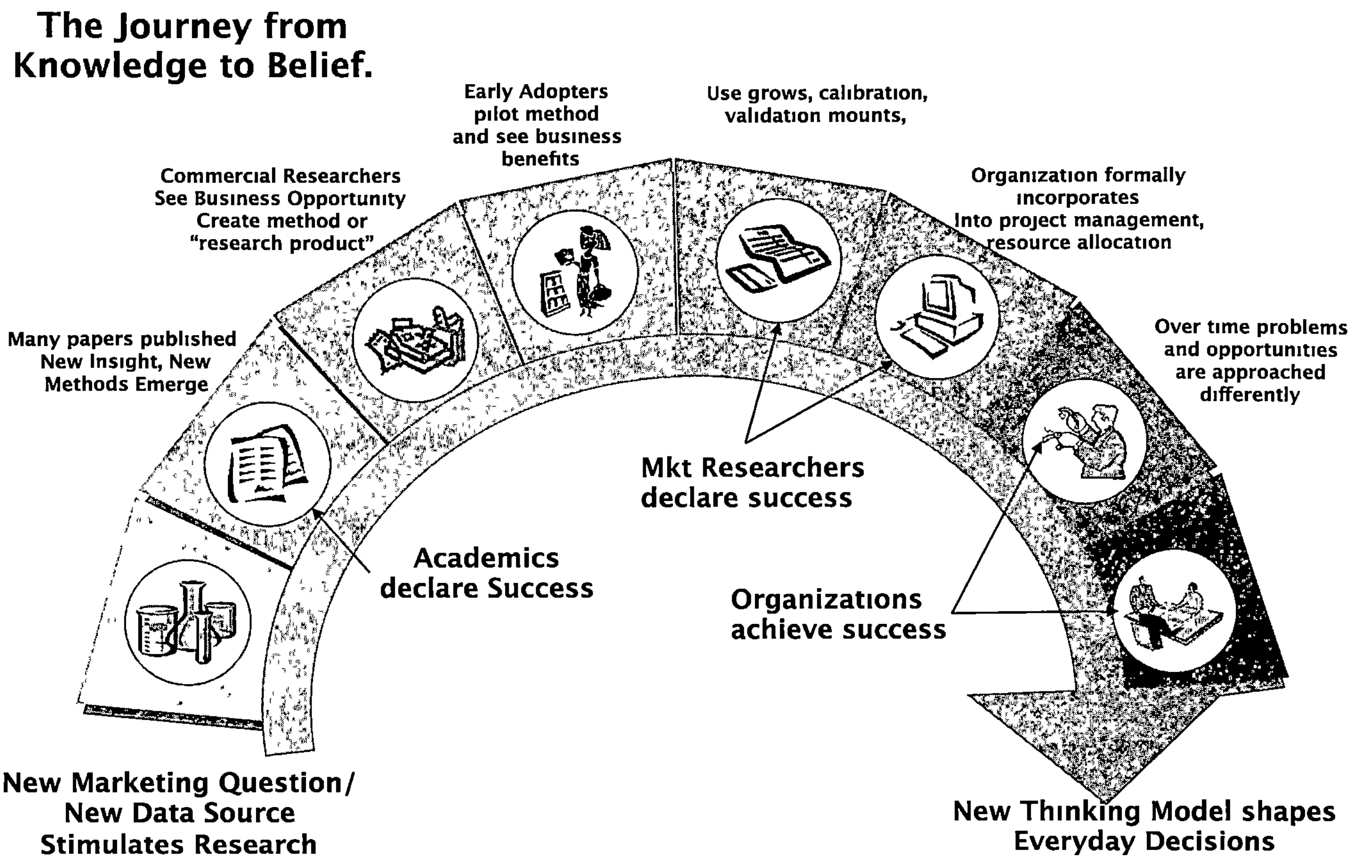
Intermediaries

Delaine Hampton, Director of Consumer and Market Knowledge at Procter & Gamble (speaking at a Practitioner–Academic Interface Session at a Marketing Science conference in June 2004), defines model success as change in mental models within the organization (Exhibit 5) A success might be invisible, embedded in an operational system (automated marketing decision modeling) and integrated into a well-defined operational process (e g , pricing process, new product development process, customer complaint resolution system) However, if it is visible and actively involves the decision maker, users and the organization itself must change their way of thinking for it to be successful

In the middle, though—taking the handoff from academics and passing that knowledge on to practitioners—are marketing intermediaries They are the marketing research firms and consultancies that have been the transfer agents of our models all along—and whose role has largely been ignored

Consider Zoltners and Sinha (2005) Their consultancy, ZS Associates (an intermediary), employs nearly two thousand people at 17 offices around the world working on implementing sales force models Their summary of what they have learned in 30+ years about marketing decision model success appears in Exhibit 6 Note that shortcomings in their early years led to better models for sure, but more important, better systems, systems more closely aligned with how sales managers actually made decisions and with the cross-functional impact of those decisions They developed modeling and systems enhancements that enabled

EXHIBIT 5
Delaine Hampton's View of the Path from the Development of a New Marketing Model to Its Actual Impact on an Organization Indicates That Mental Models Must Change It to Have a Real Impact


The Journey from Knowledge to Belief.
Early Adopters pilot method and see business benefits
Use grows, calibration, validation mounts,
Commercial Researchers See Business Opportunity Create method or "research product"
Organization formally incorporates Into project management, resource allocation
Many papers published New Insight, New Methods Emerge
Over time problems and opportunities are approached differently
Mkt Researchers declare success
Academics declare Success
Organizations achieve success
New Marketing Question/ New Data Source Stimulates Research
New Thinking Model shapes Everyday Decisions

Source Delaine Hampton, presented at Marketing Science Conference (June 2004)

users to visualize an aligned solution easily Note the analogy with Delaine Hampton's story—better models and systems blend with use experience to develop better processes Ultimately, as Zoltners and Sinha (2005, p 320) say,

> Territory alignment wisdom emerges, manifesting itself in knowledge, experience and perspective The wisdom becomes part of subsequent alignments and frequently triggers further model, system and process innovation Over time, as shown in [Exhibit 6], the role of processes and wisdom becomes larger than the role of the models and the systems

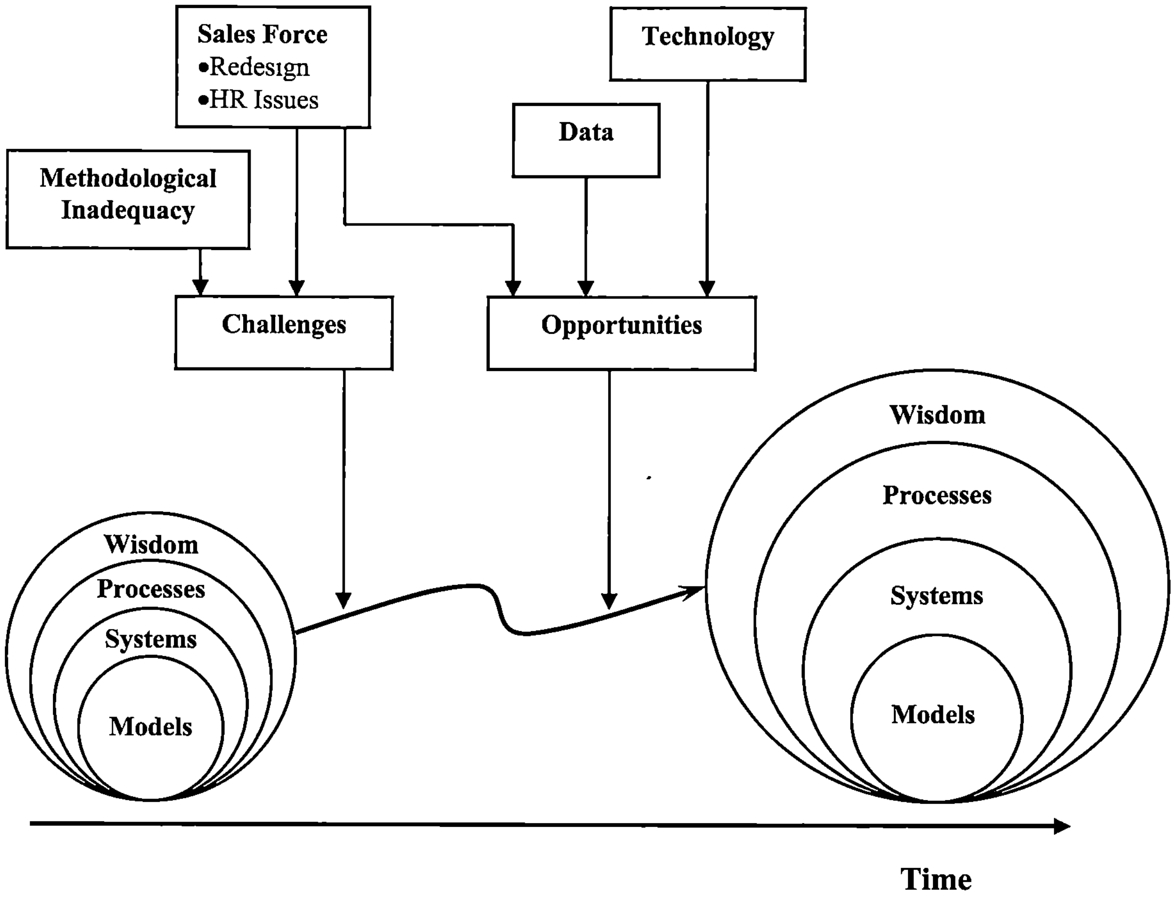
Roberts, Kayande, and Stremersch (2009) use the term "marketing science value chain" to operationalize Hampton's view that marketing science intermediaries play a key boundary-spanning role in diffusing new technology and methodology in marketing They find that two articles—namely, Guadagni and Little (1983) and Green and Srinivasan (1990)—stand out as having had both high academic and high managerial impact

Guadagni and Little (2008, p 26) comment on their 1983 article in a 25th anniversary perspective and state that the reason for its high impact in practice was that "a small, entrepreneurial consulting firm developed and sold applications based on the model " The firm they are referring to, Management Decision Systems, is the same one that commercialized Assessor (Silk and Urban 1978), an Edelman Prize finalist in 1989 Bucklin and Gupta (1999) report on the widespread commercial use of models based on UPC (universal product code) scanner data (the data that drove the use of the logit model Guadagni and Little developed) and note that intermediaries are the primary transfer agents In addition, the widespread impact of the various types of conjoint analysis, whose development Green and Srinivasan (1990) called for, would not have happened without numerous well-skilled intermediaries to deliver benefits

So what can be said about these intermediaries? Are they the "Big Uglies" (a term American football announcer Keith Jackson used to describe the members of the offensive line), those who do the blocking that permits the "skill players" to penetrate the defense, gain yards, and score? If so, what are their operations and incentives? If they are the stars or the skill players, why have they not been integrated more deeply in our discussions?

There are different segments of these intermediaries infrastructure vendors (SPSS), boutique vendors of model solutions (Management Decision Systems), large generalist firms (Boston Consulting Group, McKinsey), implementation-oriented firms (Accenture), accounting firms (Deloitte), and market research suppliers (Gallup Consulting), among others Each have somewhat different

EXHIBIT 6
ZS's Evolution over 30-Plus Years of Implementing Marketing Decision Models in the Sales Force Domain, Showing That the Changes Have Been in Systems, Processes, and Wisdom Rather Than in Modeling Technology Itself



Source Zoltners and Sinha (2005)

business models and incentives, but all potentially span the marketing academic–practitioner gap for marketing decision models

To provide some insight into the incentive issue, I recall a conversation I had when I was editor of the journal *Interfaces* (the journal of the practice of operations research and management science) in the 1980s I heard a presentation at a major conference by a principal at a top consulting firm that I thought would make a great article for the journal I asked him if he would write up his work and submit it to the journal His reply "In my business, there are three kinds of time billable time, selling time, and wasted time So which time should I use to write your article?" I made a note

Recommendations

Therefore, there are three sets of actors involved in marketing decision models academics, intermediaries, and practitioners (the ultimate model users), and I have two recommendations for each table stakes (things the reader has likely heard before) and one or two big bets, perhaps new business models for us

Academics

My entry into academia (see Lilien 2008) was a bit different than most I did my doctoral work part time while working full time in an operations research group at Mobil Corp There, I worked on leading-edge operations research applications, many in the domain of marketing decision models After obtaining my degree, I left Mobil to take a position at the Massachusetts Institute of Technology (MIT) While at Mobil, important and interesting problems regularly emerged from internal client requests I was at MIT for a few weeks, and no one brought me any interesting problems, so I went next door and asked John Little, our group head, what to do "Now you are in academia," he said "So you have to make them up " "How do I do that?" I inquired "Ask important questions," he replied

Trying to answer John's question got me into the applications end of marketing decision modeling (as well as into the business-to-business domain, my other area of interest) In both cases, I figured that the best way for me to find out what was important was to stay closely connected to practice, something that was natural at Mobil That need (combined with the major salary cut I took when I left Mobil to come to MIT) caused me to start a consulting firm It also induced me to do research that involved industry sponsorship (e g , Lilien 1979) so that, among other things, I could provide myself with a summer salary supplement, common at the time and still today in most of the science and engineering disciplines (Younger academic readers may find it hard to believe that academic marketing salaries were once low and that you had to generate your own summer support) Little (2004) and Lodish (2001) both note that the academic reward system remains a barrier to the application of marketing decision models

So what can we do, aside from lowering academic salaries, to provide the strong economic incentive we had decades ago? One action seems clear make "impact on practice" an explicit element in the tenure and promotion process, along with publication in top journals, teaching, and service Such an incentive would encourage people to work with (or become at least on a part-time basis) the intermediaries who implement developments in marketing models Some schools incorporate impact on practice, at least informally, in their personnel policies A colleague at a top institution had a limited publication record, and I thought he had nearly no chance for tenure One of his outside letters came from the head of a major U S federal research funding agency and stated that his work "fundamentally changed the way we allocate our funding resources " He got tenure primarily because his work had such significant and demonstrable impact

The development of the ISMS/MSI Practice Prize Competition and publication of the articles in *Marketing Science* represent steps in the right direction At Penn State we consider *Interfaces* a B+ academic journal for regular issues but an A publication for Edelman Prize papers, explicitly recognizing the value of impact and application Penn State also gives special recognition for articles in such high-impact journals as *Harvard Business Review*

I have chatted about the impact issue with colleagues over the years, and most say something like, "Let people wait until after they get tenure—then they can work more closely with industry or intermediaries, do consulting, now they must concentrate on publishing in A-level journals and avoiding distractions " But what people do during and immediately after their doctoral program forms habits that are hard to break

A big cost or limitation for many people doing academic research in marketing involves data limitations One of my colleagues essentially carries a sign that says, "Will consult for data " The contract he makes with an organization that has interesting and useful data is that he will consult with them, giving them much deeper insights than they can get themselves (because of his analytic and modeling expertise), and all he asks in return is to be able to use the data in his academic publications It is win-win He works with relevant, high-quality data and gets access to real business problems, he gets to apply the methods and models that he develops, and as a bonus, he gets top-quality publications In turn, the firm gets cost-effective consulting As he says, the "pay" is what most of us really value—top-quality, impactful publications

As I look back on my course outlines from a couple of decades ago, I am struck by how much useful technical content I have removed so as not to annoy MBAs Clearly, we need teaching material that students will find useful (see my subsequent comments on "just-in-time learning" as well as the effort Arvind Rangaswamy and I have invested in our Marketing Engineering initiative [decisionpro biz]) But isn't it time we rethought what we expect of our students? Finance graduates use models in their jobs because they learn about financial models in their educational training I see very little marketing education that is research focused (at least when taught by marketing modelers), rethinking the contents of marketing curriculums is in order

An idea arising from time to time is to embrace some form of the medical school model, in which both faculty and students (MBA and PhD students in our case) would be involved in ongoing work that involves real problems in real organizations (Schools of Education also do this, for example, by running their own preschools) Why can't we develop our methods and skills by serving "patients" at the same time we write articles? Can't be done? Gene Woolsey has been doing exactly this at the Colorado School of Mines for decades To graduate from the operations research/management science program there, a student must do a pro bono project for a company or agency that at least gets used and, preferably, saves money Any student, before or after graduation, who has, in one year on one project, saved his or her company or agency $1 million at present worth is given a diamond stickpin Verified savings from this plan are now in excess of $820 million (see http //speakers informs org/bios/Woolsey htm)

So, my table-stakes recommendations for academics are (1) add "impact" to the promotion and tenure process, at least for promotion to full professor, (2) encourage leaves and sabbaticals in practice, especially with intermediaries, (3) add internships to doctoral programs, (4) require at least one nonacademic letter in promotion and tenure dossiers, (5) consult for access to data and real-life problems (rather than only for money), and (6) give serious consideration to making the marketing curriculum more rigorous and research focused My big bet for academics is to embrace some form of the medical school or education school model, in which practice is integrated into both the research and educational process

Intermediaries

We are not going to induce major changes in the fundamental intermediary reward system—intermediaries are in business primarily to make money If we (academics) partner with them, copresent with them at conferences, and coauthor papers with them, intermediaries will generate the reputational capital that gets them a closer listen from their clients about the benefits of leading-edge models and methods that their more forward-thinking clients value However, there are at least two barriers Intermediaries have little incentive to write in our journals, and they often fear loss of intellectual property through such disclosure

We (academics) can provide an answer to the former concern through a coauthoring process, which would be facilitated through an internship and industry sabbatical process The latter concern is what I have called elsewhere (Lilien 1982) the "zero-sum mentality" Intermediaries who share their methodology typically do not lose business to their rivals, rather, on net, they increase the size of the market, making all better-off When Silk and Urban (1978) published their work on Assessor, they helped legitimize the market for pretest market models, the intermediary, Management Decision Systems, reaped the benefit of that publication, especially after Urban and Katz's (1983) article documenting the economic benefits of the model So who should take the first step? Note that firms like ZS and Management Decision Systems have taken the first step, being run by academics who have continued to publish, cycling leading-edge findings back to the academic community Perhaps such firms should be encouraged to be part of business schools Or maybe business schools should be in the business of both partnering with existing intermediaries and encouraging and nurturing new ones

Intermediaries often collect a great deal of data Some of that data is of little commercial value after it is out of date, but such data may retain academic value Proactively publicizing the availability of such data for academic purposes can provide a strong motivation for high-quality research The availability of the PIMS (Profit Impact of Market Strategy) database to academics by the Strategic Planning Institute (http //www pimsonline com/about_pims_db htm) spawned much high-quality academic research (see, e g , Boulding and Staelin 1990) There is considerable upside opportunity here Information Resources Inc has done something similar with its initiative through the Marketing Science Institute (http //mktsci journal informs org/cgi/content/abstract/27/4/745)

So, my table-stakes recommendations for intermediaries are (1) recognize the possibility of breakthrough work, which can lead to new lines of business, by working with academics, (2) leverage the publicity and credibility of copublishing work with academics, (3) seek appropriate academic partners both at academic conferences (many academics, few appropriate partners) and at your own conferences (where the attending academics may be attractive partners), and (4) offer internships for faculty and doctoral students

My big bet for intermediaries is to seek creative business relationships with one or more business schools In other words, embrace the medical school model for mutual gain

Practitioners

Practitioners are the ultimate consumers of marketing decision models, if they do not realize the potential benefit of our developments (either directly or through intermediaries), nothing has been gained (and I wonder what value our work really has) So why don't they get it?

In today's lean world, managers are overburdened and underresourced First, you can't use what you don't know about If the academic–intermediary partnership is successful, there will be greater visibility regarding the availability and benefits of marketing models, a necessary precondition for adoption and use

Second, people won't use what they don't understand Managers have an ongoing need for education Education should be both "just-in-case" education—what we do in MBA and executive MBA programs, namely, giving managers concepts and tools just in case they need them—and, more important, "just-in-time" education—in which the knowledge of what models are available and what is possible are brought to the manager when the business problem arises Such just-in-time education can take place in a more traditional action-learning setting (in which the teaching takes place with one or more business teams facing a business problem) or at least partly online, using web-based, interactive meeting technology Our interconnected, web-based society makes delivery of just-in-time education simpler than ever, and it is an educational mode academics should embrace

Third, managers and academics (and intermediaries) must work together to document the value of education and training It is in all of our interests to study what works, what does not work, and why so that education and training (whether just in time or just in case) is viewed as an investment, with a measurable return on that investment, and not an expense

Dan Elwing, President of ABB Electric, during his Edelman Prize Competition presentation (Gensch, Aversa, and Moore 1990) describes the changes he and his firm had to make to permit the use of marketing decision modeling Among his memorable comments (in the associated video tape available at techtv mit edu/collections/edelmanprize) was the following "Management had to lead by example I had to do regression How hard would you work if your manager did not know your job?"

Sounds like Mr Elwing is calling for putting more analytics into business programs of all levels—marketing metrics, marketing models/engineering—and for courses on the use of MDSS for better decisions A corollary is that we need to provide students with an adequate skill base so that they can undertake such analysis, or at least understand its potential and limitations

So, my table-stakes recommendations for practitioners are (1) engage academics in just-in-time education, in which practitioners learn marketing concepts and models in the context of problem solution, (2) document and communicate the short- and long-term (and soft as well as hard) benefits of such interactions, (3) take marketing analytics courses with real content, and (4) clearly document model and DSS failures as well as success so that future success can build on those failures

My big bet for practitioners is more a plea than a bet Embrace mental model change, and experiment with marketing models Some will fail, but as Hogarth (1987, p 199) notes, "When driving at night with your headlights on, you do not necessarily see too well However, turning your headlights off will not improve the situation" Indeed, as George Box points out, "All models are wrong, some are useful"

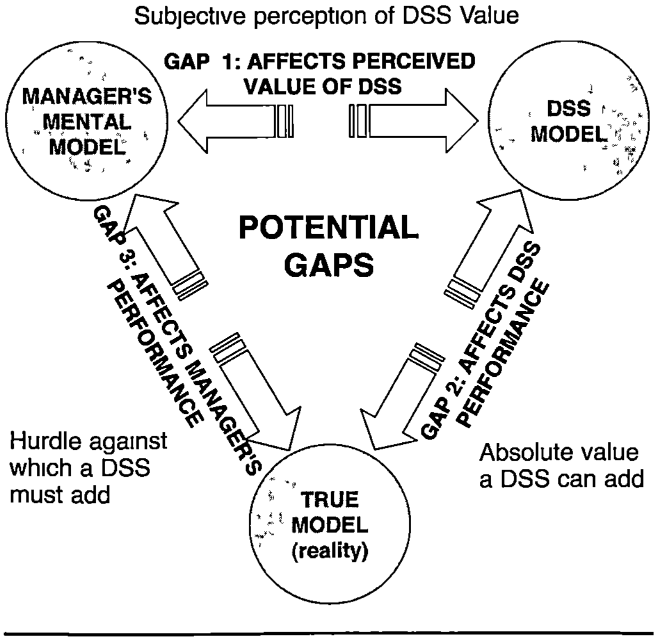
Implications for Research

I have tried to document the "what" in this article but have been rather vague about the "why." That is because we really do not know why, and we need a program of research to find out.

For example, Lilien et al. (2004) show that managers often do not think that their decisions become better when using a MDSS, even when there are objective improvements in outcomes as a consequence of model-supported decisions. Without this ability to observe the value of systematic decision making, many managers continue to do what is intuitively comfortable for them. In some industries, such as mutual funds, managers are rewarded on the basis of their performance compared with that of managers of funds with similar risk portfolios. In such situations, managers can observe (indirectly) the consequences of decisions they did not make. It is not surprising, then, that the financial services industry is one of the heaviest users of computer modeling to support decisions.

In follow-up research, Kayande et al. (2009) explore ways to bridge the gap between the decision model and users' mental models. Exhibit 7 shows that there might be a gap between the manager's mental model and reality (Gap 3) and between the mental model and the marketing decision model (MDSS, Gap 1). They show that a key reason for the lack of positive reactions to even an objectively good marketing decision model (small Gap 2) is that the model is often not designed to help users understand and internalize the underlying factors driving the model results and related recommendations (mechanisms to reduce Gap 1). Thus, the model not only must be objectively good (small Gap 2) but also must be designed and implemented in such a way that that Gap 1 is reduced. To reduce Gap 1, Kayande et al. show that a good model must provide feedback on upside potential (how much better could we do with a better mental model?) as well as feedback on why and how to change (i.e., specific guidance on the prescription for change and associated reasoning).

EXHIBIT 7
The Effect of Gaps Between Mental Model, DSS Model, and True Model


Subjective perception of DSS Value
GAP 1: AFFECTS PERCEIVED VALUE OF DSS
MANAGER'S MENTAL MODEL
DSS MODEL
POTENTIAL GAPS
GAP 3: AFFECTS MANAGER'S PERFORMANCE
GAP 2: AFFECTS DSS PERFORMANCE
Hurdle against which a DSS must add
Absolute value a DSS can add
TRUE MODEL (reality)

Notes: Relative actual value of a DSS = Gap 2 – Gap 3. Relative perceived value of a DSS = Gap 1.
Source: Kayande et al. (2009).

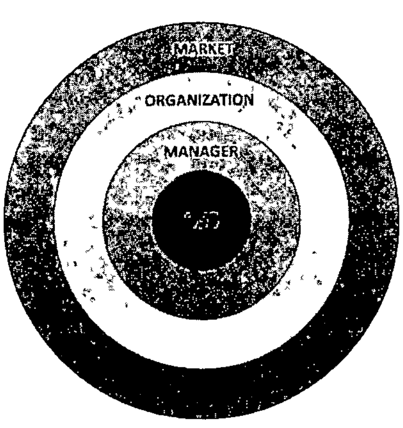
Exhibit 8 outlines our vision (a continuation of the work reported in Kayande et al. 2009) for a program of research designed to understand the adoption and use of marketing models embedded in DSS. That research program has four layers: (1) characteristics of the model and its design, (2) characteristics and traits of the manager, (3) the reward, measurement system, and culture of the organization, and (4) the characteristics of the competitive environment in which the models are to be deployed. This research program implicitly incorporates Rogers's (2003) diffusion factors but does so in a way that recognizes the institutional nature of DSS adoption. That is a challenging program of research, and I invite my colleagues to participate.

There has been work on the link between market orientation (Kohli and Jaworski 1990) and related orientations, such as technological opportunism (Srinivasan, Lilien, and Rangaswamy 2002), on firm performance. But there needs to be a careful examination of the organizational impact of marketing decision models or marketing analytics on firm performance. Is there such a thing as a marketing analytics orientation? Is the resource-based view (Wernerfelt 1984) an appropriate framework to adapt for such a conceptualization? What about the knowledge-based view (Grant 1996)?

Roberts, Kayande, and Stremersch (2009) conduct research on impactful papers and provide anecdotal evidence for why these papers (and associated models) have had the academic and managerial impact that they have

EXHIBIT 8
Vision of a Research Program Addresses the Interconnected Factors Affected the Implementation and Success of Marketing Decision Models

Research Program Vision:



- ☐ **Model/DSS**
  - ☐ quality
  - ☐ design (control)
- ☐ **Manager**
  - ☐ Need for control
  - ☐ Managerial style
  - ☐ Psych traits
- ☐ **Organization**
  - ☐ Incentives
  - ☐ Alignment, culture, organizational/top management support
  - ☐ Internal benchmark
- ☐ **Market**
  - ☐ Noise
  - ☐ Competitive pressure
  - ☐ Market trend

However, as the authors themselves admit, their research raises more questions than it answers about actual and potential impact, providing further research opportunities. They also provide an insightful discussion of the role of intermediaries. Research into the system of relationships that emerge in the academic–intermediary–practitioner triad is most welcome.

There is relatively little research in our top (marketing) journals or at our professional conferences on the personal, organizational, and environmental forces that affect the use and implementation of marketing decision models. Many of my colleagues have suggested that such work is not "marketing." I urge my colleagues to consider that if we believe our own rhetoric about the need for interdisciplinary/cross-disciplinary work in business (after all, what business problem in marketing does not affect production or the supply chain or have an IT component and financial and human resources implications?), then we should to be proactive in including such work in our top journals. Such inclusion will require a cultural change, and the time for that change is overdue.

Conclusions

I am grateful that the *Journal of Marketing* editor, Ajay Kohli, provided me with this opportunity to address an issue I feel deeply about. I hope I do not seem too negative; indeed, there have been many documented successes over the years. Perhaps the most dramatic are the ones we cannot see—the automated marketing decision models. For example, as Jeff Bezos (see Kirby and Stewart 2007) points out, at Amazon.com, when people have a campaign or a conjecture that they want to test (a new model of customer response), the company evaluates it in a test-control environment and determines its return on investment. If it is profitable, the model becomes a new way of doing business. The revenue management systems that began in the airlines industry and have spread throughout the service sector provide similar invisible implementation stories.

I am more concerned about the opportunity cost of the more visible application opportunities—the marketing decision modeling opportunities we have missed. The mismatch between the academic reward system and real managerial impact of marketing decision models is a deep and continuing problem; the silo-based nature of our profession, both in our academic reward system and in the classroom, needs to be carefully rethought. As academics, we need to partner more closely and creatively with intermediaries to see our creative accomplishments implemented and have the impact that we aspire to for them.

We have built many better mousetraps, but customers are not beating a path to our door. We have forgotten that building mousetraps is what engineers do; marketers (real ones) try to understand and satisfy real needs, develop solutions for those needs, and communicate the value of solutions to the customers whose needs they have attempted to address. If we can get mousetrap builders, customers, and intermediaries better connected, all will benefit. It will take work, culture change, and a lot of reflexive thinking. But that is what marketing is all about, isn't it?

Appendix

Some Published Examples of the Value on Marketing Decision Models

Lodish et al. (1988)

Syntex Laboratories was concerned about the productivity of its sales force. In particular, managers were unsure whether the size of the sales force was right for the job it had to do and whether the firm was allocating its sales force effort to the most profitable products and market segments. The company used judgmentally calibrated market response models and a resource allocation optimization tool to evaluate the current performance of its sales force and to develop sales force deployment strategies that were in line with its long-term growth plans. This modeling approach resulted in more than $25 million in profit above original plan.

Wind et al. (1989)

Marriott Corporation was running out of good downtown locations for new full-service hotels. To maintain its growth, Marriott's management planned to locate hotels outside the downtown area that would appeal to both business travelers and weekend leisure travelers. The company used conjoint analysis as the core of their program to design and launch the highly successful Courtyard by Marriott chain, establishing a multibillion dollar business and creating a new product category.

Gensch, Aversa, and Moore (1990)

ABB Electric, a manufacturer and distributor of power-generation equipment, wanted to increase its sales and market share in an industry that was facing a projected 50% drop in demand. By carefully analyzing and tracking customer preferences and actions, it determined which customers to focus its marketing efforts on and what features of its products were most important to those customers. The firm used choice modeling to provide ongoing support for its segmentation and targeting decisions, introducing the idea of targeting the "switchable customer." The analysis led the firm to increase its market share from 4% to more than 40% over a period of ten years and to increase its profitability; indeed, this action was critical to the firm's survival.

Smith, Leimkuhler, and Darrow (1992)

American Airlines faced the ongoing problem of deciding what prices to charge for its various classes of service on its numerous routes and determining how many seats on each scheduled flight to allocate to each class of service. Selling too many seats at discount prices, overselling seats on a flight, or allowing too many seats to go empty leads to low revenues. The airline pioneered the use of yield management (now known as revenue management) models to fill its planes with the right mix of passengers paying different fares and credits the approach with more than $500 million per year in incremental revenue.

Elsner, Krafft, and Huchzermeier (2004)

Rhenania, a medium-sized German direct mail-order company, used a dynamic, multilevel response modeling system to answer the most important direct marketing questions when, how often, and to whom the company should mail its catalogs The model helped the company increase its customer base by more than 55% and quadrupled its profitability in the first few years after its implementation

Roberts, Nelson, and Morrison (2004)

Telstra, the Australian telephone company, was facing the threat of competitive entry by a major rival, Optus, and sought help in developing a defensive marketing strategy The company developed probability flow models to provide a framework to generate forecasts and assess the determinants of share loss Telstra used the models to set prices adaptively, direct service initiatives, design advertising copy, and dimension the network (including financial and manpower planning) The model led to incremental revenue of more than $50 million a year

Zoltners and Sinha (2005)

ZS Associates has implemented various marketing decision model tools to support sales territory alignment decisions, designing sales territories and assigning sales representatives to them for more than 500 clients representing 500,000 sales territories in 39 countries ZS Associates reports increased revenues for those firms by more than $10 billion and have saved 14,500 salesperson equivalents in travel time reduction in the first year of these alignment implementations

Silva-Risso and Ionova (2008)

J D Power and Associates developed a promotional analysis decision model that enabled automobile manufacturers to improve the timing, frequency, and components of their promotional activity to maintain sales but reduce margin loss The company reports savings of approximately $2 billion across the auto industry, with Daimler Chrysler executives alone claiming annual benefits of $500 million

Natter et al. (2008)

Telering, a leading Austrian cell phone supplier, was severely threatened by competitive activities By undertaking a detailed segmentation analysis, Telering identified a new market opportunity A sophisticated perceptual mapping model made the resulting service innovation credible to senior management and overcame internal barriers to its launch and suggested how the product could be introduced through a compelling advertising campaign The new service returned more than $20 million in incremental revenue to Telering

Kannan, Pope, and Jain (2009)

National Academies Press was concerned about the best way to price and distribute multiple formats (both print and PDF) for its books via the Internet The company built a pricing model that allowed for both substitution and complementarity (customers buying both forms) and calibrated the model with a sophisticated choice-modeling experiment The results permitted National Academies Press to launch its entire range of digital products with a variable pricing scheme, which helped the company meet its profit objectives and maximize the reach of the authors' work

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Bernard J. Jaworski

On Managerial Relevance

The concept of managerial relevance continues to be a significant topic for both research faculty and business schools alike Despite decades of debate, it is surprising that there is virtually no work on the nature of the concept itself Thus, the author defines the concept of managerial relevance, makes three specific observations, and discusses research implications for each observation The key message is that the field needs a much deeper understanding of the marketing roles within the firm, and research programs must be crafted to fit the needs of these particular roles The author calls this approach "role-relevant" managerial research With this central thesis in mind, he examines the role of the chief marketing officer (CMO) as an illustrative case study to identify areas of inquiry that are both novel and highly managerially relevant This analysis reveals that of the seven core tasks of the CMO, three have been lightly investigated The author concludes with advice to both academics and practitioners on how to increase the role relevance of academic research

Keywords managerial relevance, chief marketing officer, knowledge, practitioner

Like *Roe v Wade*, Bill Clinton, and Manchester United, managerial relevance stimulates visceral emotions from fans and foes alike In the extreme, it is a polarizing force that divides business school faculty on a variety of issues, such as faculty hiring, the evaluation of a body of work for promotion and tenure, the significance of a research contribution, and the materials used in core business curricula Moreover, it can fundamentally shape the career arc of a faculty member, affecting the pursuit of a research focus, the choice to join a particular department, or even the decision to leave the discipline altogether The origin of this visceral reaction, I believe, can be traced to two camps within the marketing discipline—although I presume these camps extend to other business school disciplines as well The first camp has a clear, self-identified segment of scholars who believe that managerial relevance is the sine qua non of business scholarship While scientific rigor is exceptionally important and taken as a necessary condition, business scholars must also focus on managerial impact For this fan base, nothing can be more important than having a direct impact on the thinking and actions of current and future managers The second camp has an equally committed set of scholars who believe that managerial relevance need not be the centerpiece of scholarship Indeed, many scholars in this segment believe that a focus on managerial relevance could significantly impair the quality of ideas and theory development by constraining the type, form, and content of scholarship

Curiously, this emotion occurs in the absence of a clear definition and understanding of the concept itself As such, the concept of managerial relevance operates in practice as a Rorschach test, everyone seems to have an idea of what it means when they see it, but it is a highly personal interpretation There is certainly a great deal written on the need to be more relevant (e g , Carraway and Clyman 1997, Das 1993, Ghoshal 2005, Hambrick 1994, Lawler et al 1985, Porter and McKibben 1988), the purported limitations or failures of business schools (e g , Bennis and O'Toole 2005, Mintzberg 2004, Tushman et al 2007), and the need to consider multiple stakeholder groups (e g , Alutto 1993, Hitt 1998) In marketing, the concern for relevance has been voiced over the years (for a broad historical review, see Danneels and Lilien 1998), and a recent editorial has suggested that marketing is becoming increasingly irrelevant to practice (e g , Reibstein, Day, and Wind 2009) However, in all cases, the meaning of managerial relevance is simply assumed Perhaps most scholars believe that its meaning is obvious and, thus, not worth exploring Or the topic itself may not be perceived as scholarly—what can be said that is genuinely interesting, novel, and theory driven about managerial relevance?

This lack of precision is problematic in four respects First, absence of a clear definition and common meaning of managerial relevance allows the two aforementioned camps to talk past each other rather than engage in meaningful debate Second, because we lack a categorization scheme or typology to map the various types or categories of managerial relevance, we truly do not know how managerially relevant the collective body of marketing scholarship has been Third, a lack of a categorization scheme makes it difficult to identify "gaps" and "surpluses" in managerial thought Finally, lack of a solid baseline discussion and framework makes it difficult for scholars to push the envelope on their thinking about the topic This article aims to define and clarify managerial relevance and act as a catalyst for debate, disagreement, and future scholarship

Although a host of marketing and business scholars could craft an article on this topic, I believe that I bring a unique perspective The first 13 years of my career fol-

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lowed a traditional academic path, culminating in a Full Professor position at University of Southern California While teaching and service were important, my career advancement was based primarily on my record of publishing and citations in top-tier, peer-reviewed journals For the past 10 years, I was a full-time senior partner of Monitor Group, a global management consulting firm During this period, I spent most of my time advising senior marketing executives across a variety of industries Recently, I joined IMD to serve and build its North American client base In the William Foote Whyte tradition of *Street Corner Society*, I have been very fortunate to not simply observe senior executives but also to participate in their lives through work-centered, data-intensive dialogue on a range of topics including marketing strategy, organization, and leadership Most of my work at Monitor involved multiyear, large-scale transformations of marketing organizations—modifying processes, structures, orientation, and rewards I fully recognize that living in both the academic and the practitioner worlds does not by itself guarantee insight, however, my experience affords a level of deep exposure to both worlds that would not have been possible had I spent life solely in academia or practice

The purpose of this article is to explore the concept of managerial relevance I begin by providing a definition and make three observations about the concept A central observation is that a key to making a managerial impact is to *thoroughly* understand a particular role in the organization and select a specific "route to impact" for that *particular* executive I term this concept "role-relevant research," in sharp contrast to the widely used term "managerial research," which often appears to assume that there is a generic group of managers "out there" who should be able to apply study findings within their organization That is, what is relevant to a chief marketing officer (CMO) is not likely to be as relevant to a first-line marketing researcher or a brand manager Moreover, on the basis of my ten years of advisory work, I firmly believe that we have only superficial, outdated knowledge of marketing roles and positions within firms With this baseline view, I then go on to explore literature gaps with respect to the CMO role In particular, I articulate the seven core tasks necessary to perform the CMO role It is essential to document this set of tasks because relevance must be assessed relative to the specific tasks of a given position This section also reveals that there are significant gaps in our knowledge that would be relevant to the CMO I conclude with a discussion of the role that both academics and managers can play in increasing role-relevant marketing knowledge production in the practice of management

Managerial Relevance: Definition and Observations

Managerial relevance is defined as the degree to which a specific manager in an organization perceives academic knowledge to aid his or her job-related thoughts or actions in the pursuit of organizational goals Academic knowledge, in this context, is broad and includes concepts, theories, frameworks, empirical findings, models, measurement instruments, and decision support tools In the following discussion, I make three specific observations about the definition and discuss the implications for research in marketing (see Table 1)

Observation 1

> Observation 1 Managerial relevance is an assessment by a *specific* manager in a *particular* role

Research implications The first implication of Observation 1 is that relevance is a perceptual measure that must be judged by managers, not "organizations" in general Organizations themselves cannot act on information Rather, it is the manager in the organization who is the recipient of the knowledge and who chooses to act (or not act) on the information In turn, managers' decisions have an impact on the performance of the organization More specifically, new knowledge is evaluated differently by each position within and across organizational hierarchies Knowledge rated as highly relevant by a CMO may be rated low by a brand manager Furthermore, this perception of relevance is likely to vary based on the pressures confronting a particular position at a particular point in time Thus, in the late 1990s, CMOs may have been preoccupied with the emergence of online media, today, CMOs may be more concerned about profitable growth under challenging economic circumstances Indeed, what is perceived as highly relevant by one CMO at a particular firm or point in time may be perceived as irrelevant by another CMO

The CMO at one of my medical device clients felt that a key aspect of the company's new market-planning process must focus on the creation of new opportunities based on unmet customer needs Thus, our firm built a particular set of unmet-needs analysis tools into the market-planning process At another noncompeting medical device organization, the CMO felt the focus should be on growth in existing markets Here, breakthrough innovation was not part of the firm's standard market-planning process My sense is that the CMO in the first medical device company would have enjoyed hearing about the details of Chandy and Tellis's (2000) findings because this research paper would affect his thinking on radical innovation In contrast, the second CMO in the same industry would likely have found this set of knowledge significantly less relevant to his circumstance As such, researchers need to be sensitive to, and on the lookout for, these types of firm- or industry-specific contextual variables (e g , strongly held assumptions above growth opportunities, industry norms) that shape judgments of relevance

Second, we need to know much more about the roles of various marketers in their organizations In my view, we have only a superficial understanding of marketing roles within firms My perception is that our literature and textbooks are biased heavily toward a function-centered role perspective and have not keep pace with (1) the role of marketers in the broader enterprise and (2) the increasing general management, operations, and leadership responsibilities of senior marketers My recommendation is that marketing academics who want to pursue managerially

TABLE 1
Observations, Implications, and Recommendations

Observation	Implication	Illustrative Research Recommendations
Managerial relevance is an assessment by a manager in a particular role	1 Relevance is a perceptual measure that must be judged by each position within and across organization hierarchies	1 Focus on the manager, not organizations in general 2 Focus research on contextual variables, such as industry norms and competitive dynamics, that can increase the perceptions of managerial relevance
	2 We need to know more about the roles that various marketers hold in organizations	1 Immerse research programs in the world or particular managers in particular organizations Address their needs and then look for generalization 2 Craft recommendations to specific positions in the firm
	3 Managers assign judgments of relevance according to the degree to which the research is related to decisions tied to his or her job tasks	1 Identify core job tasks Analyze surpluses and deficiencies of marketing knowledge per tasks Be open to discovery of "new-to-world" tasks 2 Build research programs based on most important job tasks and decisions
	4 Craft communication content and format to meet managerial need	1 On content, linkages among concepts are necessary but not sufficient Describe specific actions to be taken by specific managers 2 Peer-reviewed journals are for academics For managers, publish briefs in everyday language that can easily be found online
There are multiple categories of managerial relevance	1 Examine triggers that may influence recall and use in the future	1 Identify how the needs of senior marketing executives evolve over career stages 2 Identify when a particular type of marketing knowledge is most relevant for decision making and/or "perspective "
	2 Need to understand "routes to impact "	1 Identify various major routes to impact and associated barriers and drivers of relevance 2 Determine events, developments, or crises that stimulate a particular route of impact
	3 Need to understand how managers evaluate knowledge relevance in each category	1 What are the criteria used by managers to assess relevance across the cells? 2 Are actionability, importance, and meaningfulness the best criteria to assess "present, action" relevance?
Managers consume many types of managerial knowledge	1 Certain types of knowledge map to particular organizational roles	1 Develop typology of knowledge type by marketing position to understand degree of relevance for each position 2 Are tools more useful for junior practitioners and concepts more useful for senior practitioners?
	2 Managers have different knowledge needs that are contextually triggered	1 Understand how context shapes dominance of one knowledge type versus an alternative knowledge type 2 When does a manager search for conceptual vs information vs tool guidance?
	3 Information has "spot-market" impact Concepts have a long-lasting impact	1 Is your purpose to influence short-term, one-off decisions of managers or to influence their worldview of marketing? 2 Focus on simple ideas that provide an umbrella for a family of concepts (e g , built to last, value chain)

relevant research should immerse themselves in the world of particular managers (e g , CMOs) in particular industries (e g , technology) Here, the focus should be on the relevance for these managers first, then, the researcher can look for generalizations that apply across manager types and industries

As a result of deep exposure—through multiple research projects, reading trade literature, attending or presenting at trade conferences, and reading speeches or interviews by a class of managers in a specific industry—researchers can obtain a good feel for the manager's perspective This field-based knowledge of the manager's perspective will often serve as a reasonable proxy for the manager's actual perception of relevance

Third, and building on the second point, I believe that managers assign judgments of relevance based on the degree to which the research is related to decisions tied to their core job tasks Subsequently, I assert that the job of the CMO can be categorized into seven core tasks Thus, all else being equal, the degree to which the research is related to one of these core tasks is likely to be judged more relevant than research that is unrelated or only indirectly related to their tasks For example, for a client brand manager in a well-regarded packaged goods firm, the role of Wal-Mart is of paramount importance in gaining channel access. In sharp contrast, in one of my agribusiness clients, the brand managers are constantly fighting commodity prices in direct channels. Both of these clients are brand managers, but their job descriptions and role activities are very different.

To be more specific, my recommendation is that we need to spend much more time observing, recording, and analyzing managers' work in their natural setting to obtain a richer perspective of their job tasks. We should not take the formal job description for granted, since this description is only likely to cover the obvious job tasks, not the unwritten job demands. In turn, we can develop our research programs around the gaps in knowledge related to these understudied tasks. Certainly, executive education is one format to get close to managers, but this is based largely on managers' self-reports about their tasks rather than true time and resource allocation studies. Being at their work location—reviewing their time allocation to activities, watching how they interact with other functions of the firm, and observing "hall talk"—allows for observation-based insights rather than a reliance on self-report. I am concerned that our current emphasis on theory-driven, quantitative work—whether survey, experimental, or modeling—encourages investigations on nuanced relationships among well-known variables rather than the discovery of completely new phenomena. I believe that observing a "month in the life" of a sample of managers holding similar positions will stimulate the discovery of new-to-the-world marketing concepts and theory.

Fourth, academic research tends to be presented in a format that stresses linkages among concepts. The problem with this approach is that it is often not actionable even for the thoughtful practitioner. Consider, for example, the strong empirical evidence that the greater the market orientation, the higher the financial performance. How relevant is this finding to, say, the CMO? At one level, the finding provides strong evidence that the more market centered the organization is, the higher its likely performance will be. However, the research stream fails to tell the CMO exactly what he or she should do to make the organization more market oriented. On the basis of recent research, we can make the recommendation to "allocate more resources to customer insight" or decentralize the organization to allow decision making to unfold at the market level, but even these insights are generic, superficial, and high level. They mask the organizational and leadership realities of "getting it to work" in the organization. Thus, we need to be much more prescriptive and action oriented at the level of the specific manager.

Finally, let's stop kidding ourselves about the role of peer-reviewed marketing journals. Their target audience is academics. The writing style, citations, structure, and vocabulary are all meant for a highly specialized, trained group of professionals. Certainly, there is a small population of highly specialized market researchers or modelers who may find some of this work directly related to their everyday jobs, but the purpose of the journals is to create a forum for academics. So, asking managers to "rate a journal article" on its degree of managerial relevance misses the point of the journal entirely. In addition, asking managers to "read a journal article for an executive education class" to extract the nugget of wisdom is exceptionally inefficient and disrespectful of the manager's time. Instead, we also need to present our core knowledge in easy-to-digest, easy-to-comprehend, and easy-to-find (online) formats that can be quickly processed by the time-pressured manager. In this best of all worlds, these are integrative summaries of a body of work versus single-study results (see DeNisi 2010).

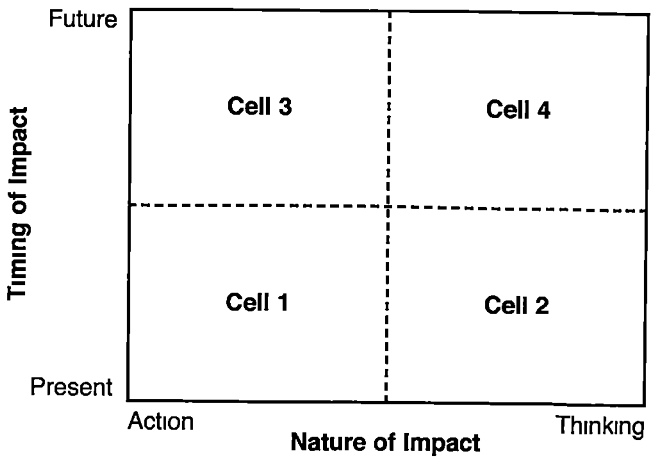
Observation 2

> Observation 2: There are multiple categories of managerial relevance. The categories can be classified according to the outcome that is being sought. The outcome can be classified in terms of timing of impact (present vs. future) and nature of impact (thought vs. action).

Managerial relevance is broader and more nuanced than previously articulated. One class of relevance is for immediate action. At the other extreme is a set of ideas that has the potential to affect deeper thinking in the future. Equally important, certain pieces of marketing knowledge may trigger deep thought but no immediate action. As such, my first point, which I elaborate in greater detail subsequently, is that it is more appropriate to think of classes or categories of managerial or role-relevant knowledge than to narrowly focus on present, action-oriented knowledge.

As Figure 1 shows, managerially relevant knowledge can be classified into four cells. The first axis pertains to the timing of the impact, which can be in the present or in the future. The second axis pertains to the nature of the impact—that is, whether it is thinking or acting. Focusing exclusively on present action underrepresents the impact on the individual manager. My impression is that commentators on managerial impact often focus on the short-term impact on managers' actions (i.e., Cell 1). In the best of all worlds, controlled, clinical studies, such as those featured in the *New England Journal of Medicine* that demonstrate the clear efficacy of Drug A over Drug B, are prototypic of Cell 1 relevance. Almost immediately, practicing physicians act

FIGURE 1
Managerial Relevance



to change their prescribing behavior to Drug A. In this case, there is a clear, short-term, measurable link between research and the practice of medicine. While we rarely engage in such highly controlled studies in a for-profit setting (e.g., a marketing academic works with a firm to design a study in which sales representatives in District A receive "reward treatment x" and sales representatives in District B receive "reward treatment y"), I believe we can readily identify work in marketing that can be classified as Cell 1 research.

Cell 1 captures these direct, easily traceable impacts on practice. A good illustration would be the organizationwide adoption of a standard measurement scale, such as the National Customer Satisfaction Index (Fornell 1992) or the SERVQUAL (Parasuraman, Zeithaml, and Berry 1988) instrument. In these instances, we would be able to observe adoption patterns and track the impact of these adoptions on key output metrics (e.g., increases in the level of customer satisfaction in year-over-year studies).

Cell 2 focuses on a particular manager's short-term thinking. If asked, the manager would note that the knowledge either reinforced or reshaped his or her mind-set. The best knowledge either provides data to support immediate choices or challenges strongly held beliefs about a topic, provides a completely different view, or provides a "left-field" surprise. The key is not simply the thinking, it also includes the notion that, at some point, the knowledge will likely be put to action. Oliver's (1999) thought piece on the limits of customer satisfaction and loyalty—in particular, the notion that loyalty may not be achieved as a reasonable goal for many service providers because of the nature of the product category or consumer disinterest—is a clear example of an idea that can immediately affect a brand manager's perspective.

Cell 3 centers on action in the future. A classic example of this situation is when a manager puts contingency plans in place for future events or outcomes. The notion is that when early signals suggest a change, the manager and team will shift their actions, adjusting plans or go-to-market strategies. At the heart of Monitor's client work with scenarios is the process of getting the senior management team to identify the critical uncertainties of the future, to construct scenarios for various alternative end states, and to prepare to take steps in the event that "early signals" suggest that one scenario will emerge. Action is clearly expected to take place in the future, but events need to play out in a particular way before a specific action is taken. In marketing, simulation models are frequently developed with alternative actions built into the plans rather than depending on how the market unfolds. Cooper's (2000) approach to strategic marketing planning is one such example. His approach to the construction of market plans for radically new products is designed to "update" as various events unfold.

Cell 4 focuses on the manager's thinking in the future. Upon initial exposure, the notion is that the manager may find the idea interesting but does not have a readily available situation/context to apply the insight. The knowledge may also be only one piece of a larger puzzle, so it cannot be acted on until the other pieces are revealed. Alternatively, the knowledge may require some "buildup" of additional evidence to finally reach a threshold for action. Thus, the notion is that the manager is initially exposed to the idea, but the timing, the lack of complete understanding, or simply the lack of immediate applicability impedes its use. As a result, the information is stored in memory until certain marketplace issues stimulate its retrieval. For tradition-bound, risk-averse firms, emergent research on social media, brand communities (McAlexander, Schouten, and Koenig 2002), or new media advertising (e.g., Manchanda et al. 2007) may need to accumulate over time to eventually reach a "tipping point" for managerial response.

Research implications. There are three basic research implications of this framework. First, we should begin to examine "triggers" that may influence recall in the future. One can imagine both external triggers that create fundamental shifts in the marketplace, such as disruptive innovations, and internal triggers that influence the shift from long-term memory to short-term salience. In a client context, Monitor would frequently describe the process for large-scale marketing transformation, knowing that the CMO was only beginning the journey with one lever of change (e.g., standardize the market-planning process). However, providing the overall context in which multiple levers must be changed (e.g., human resources competency modeling for various marketing positions, the decision rights for the marketing organization) in a sense creates a readiness on the part of the CMO to want to "re-hear" our point of view a year or two in the future. A key question then for this cell is, How likely is it that a set of findings or ideas will be useful to reflect on in the future? That said, there are inevitable surprises that can also trigger recall.

As Table 1 shows, there are two academic research questions that immediately follow from the notion of triggers that stimulate the need/demand for new information. First, it is likely that promotions to new positions are key triggers that guide the search for new information. As the brand manager moves into a position of general management for a family of brands, the demands for understanding intraorganizational dynamics, resource trade-offs among the portfolio of products, and "family-of-brands" equity increase. So, what are the information needs of managers as they transition to new positions? Second, managers may be confronting a pressing issue (e.g., Does the manager increase price in response to a competitor's price increase?) or a constant threat (e.g., How does the manager compete with low-cost players?) that require different information needs. This raises the question whether different types of knowledge are the triggers for present action (e.g., research findings) versus future thinking (e.g., theory).

Second, there are multiple pathways to affect managers. At the end of the day, impact will be about action in the present. The question then is, What are the alternative routes to impact? I posit at least three routes. First, the most obvious pathway is when present thinking (Cell 2) leads to present action (Cell 1). One can read a Marketing Science Institute summary and immediately take action. The second is when an event, development, or crisis stimulates the retrieval of relevant knowledge (e.g., contingency plan is triggered) for immediate use For example, in the late 1990s, Morgan Stanley developed a very specific plan for Y2K that focused on how to conduct trading activities in the event of systemwide computer inoperability While the Y2K problem was largely avoided at Morgan Stanley, the September 11 attack triggered the firm to implement the "off-the-shelf" Y2K emergency plan In this sense, the path traveled very quickly from Cell 4 to Cell 1 Third, it may be the case that the information is further refined and discussed Thus, the route is Cell 4 to Cell 2 to Cell 1 In particular, this is the "missing-puzzle-piece" route In effect, this scenario would emerge if the last piece of a puzzle triggered immediate thinking, quickly followed by action So, researchers who are concerned about managerial relevance should be looking to identify the primary routes and the conditions that stimulate a particular route to increase the probability that their research will travel that route

Third, we need to obtain a richer understanding of how managers evaluate knowledge relevance in each of these four quadrants I believe that the managerial needs shape criteria that managers employ Thus, if the executive is searching for help to inform an immediate decision, he or she is likely to evaluate the actionability of knowledge as particularly important In contrast, if the decision is not urgent—but is important for the strategy of the marketing group—then the quality of the reasoning and the associated set of compelling examples may be more important So, in effect, if the manager is focused on a short-term pressing issue, one set of criteria may be employed to judge research relevance, whereas if the need is to stimulate thinking in the short run, a different set of criteria applies

With this logic in mind, I propose three criteria to judge managerial relevance quality in Cell 1 (present/action) actionability, importance, and meaningfulness Actionability means that the insight is specific enough to direct behavior or choice (e g , whether to enter China) Importance is the degree of risk/reward that is at stake for the manager and firm Meaningfulness is the degree to which the insight provides (at a minimum) short-term competitive advantage The notion here is that there may be highly actionable findings (e g , Do we employ in-store point-of-purchase advertising?) that are not necessarily highly strategic or meaningful, in the sense that they are unlikely to sustain competitive advantage Importance is about the overall reward or revenue that is at risk in a particular decision It is possible to observe situations in which there is a fair amount of money at risk but the key issue is not strategic in nature (e g , when allocating equivalent funds for advertising to maintain parity in marketing communications)

For "future thinking" (Cell 4), recall that the manager has initial exposure to the idea but does not act Instead, the idea is stored away such that it has the possibility of being triggered at a later point The key issue here is the encoding strength of the information at the time of exposure All else being equal, for the senior marketing executive, encoding is stronger (and retrieval more likely) when the marketing knowledge directly affects a strongly held mind-set/perspective of the executive either with supporting data or, more likely, when it (1) challenges strong held assumptions, (2) has the potential to impact significant resource allocation, or (3) has the potential to impact sustainable competitive advantage.

In summary, Observation 2 recognizes that we need to move beyond "short-term action" as the only basis to judge managerial or role relevance Managers have a variety of information needs depending on the timing of their decisions and the nature of the impact sought A deep investigation of managerial relevance would not simply look for gaps in knowledge relative to organization positions (observation 1) but would also consider the "routes to impact" to fully maximize the research relevance

Observation 3

> Observation 3 Managers consume many types of marketing knowledge

The purpose of this section is to briefly describe the various types of academic knowledge and propose three specific implications for research on managerial relevance (for a similar, but broader, typology, see MacInnis's [2011] article that appears in this issue [specifically, the "Entities Around Which Conceptual Advances Can Occur" section]) While there are many definitions of knowledge, I define academic knowledge as any form of information produced (e g , specific research finding, conceptual framework, mathematical model) by an academic community I describe three broad categories of marketing knowledge, as well as eight specific types

Empirical findings Empirical findings are defined as aggregated data (e g , coffee sales at supermarkets), results (e g , benchmarking study, industry report), or study findings (e g , Does in-store marketing work?) that may (or may not) have been processed into higher-order insights or recommendations While aggregated industry reports are not typically produced in academia, these data and information sources could be part of a research institute, center of excellence at a business school, or a marketing department

Conceptual research concepts, frameworks, and theory Concepts are defined as ideas that are generalized from particular instances to form the basic building blocks of theory Good examples of marketing-specific concepts are brand equity, market orientation, brand communities, and industrial buyer center Concepts often emerge from new ideas that are rough in form and not clearly defined (either alone or relative to other concepts) The introduction of a new concept (e g , brand communities) has the potential to affect the CMO by (1) reinforcing prior beliefs, (2) challenging strongly held assumptions, (3) stimulating interest to learn more, or (4) implementing the adoption of the new concept

Frameworks are approaches to organize and summarize research findings or concepts into more manageable, parsimonious chunks Stages of the industrial buying process, Porter's (1980) five forces, the hierarchy of effects, and Miles and Snow's (1978) typology are all good examples of these Each is derived from observations of practice (e g , industrial buyer behavior), a comprehensive review and integration of the literature (e g , Porter's five forces), or the creative blending of convergent/divergent literatures into a coherent whole (e g , Howard and Sheth's [1969] model)

The purpose is to provide a clear, simplified perspective to illuminate what is known and not known

Theory has been defined as a well-substantiated explanation of some aspect of the natural world that is based on a body of facts that are often confirmed through observations and experiments Agency theory, transaction cost economics, and prospect theory are well-regarded examples of theories applied in a marketing context The purpose is to provide clarity about the relationship among variables that is both stable and generalizable

Tools processes, measurement instruments, methods, and models Tools enable practitioners to more consistently and formally implement ideas, concepts, frameworks, and theory Perhaps the best example is when a measurement instrument (e g , SERVQUAL) follows from fieldwork and the building of a sound conceptual framework However, tools may also represent organizational processes For example, to implement Porter's five forces, one would want to know the multistep approach or process to be followed The process in this sense is the field guide or owner's manual on how to do a particular task in a work setting For example, most firms have a common brand- or product-planning process that enables all marketers in the organization to follow the same approach Finally, if the theory is well developed and defined, it is possible to model that behavior or phenomenon (e g , diffusion of innovation theory and associated models) In what follows, I discuss four types of tools processes, measurement instruments, methods, and models

As commonly understood in practice, a process is a specific way for a manager to complete a particular work task For example, a firm may have its standard approach or process for segmenting markets Often, this is expressed as a multistep activity complete with templates and instructions A good example is the standardization of the brand-planning process in life sciences firms This standard process includes specific advice, wisdom, rules of thumb, and examples Some firms call these "methods" or "approaches," while others refer to them as "applications " The key point is that it is a standard approach to doing the work

Measurement instruments are "diagnostics" that illustrate potential gaps in the performance of activities that matter within the firm For a banking organization, SERVQUAL can be a key tool to guide the codification and specification of service activities for frontline employees Measurement instruments are always based on prior conceptual work When done rigorously, the researcher follows conventional research methods to development, test, refine, and finalize the instrument

Methods are most associated with marketing research For example, there are qualitative and quantitative methods They represent a codified approach to solving a particular problem (e g survey research) A research method is a well-defined subset of the broader organizational processes

Models also have an established approach, but they typically have a higher standard of quantitative input and associated mathematical rigor Lilien (2011 [in this issue]) defines marketing decision modeling as a systematic approach to harness data and knowledge to drive marketing decision making and implementation through a technology-enabled and model-supported interactive decision process Moreover, Lilien notes that when human judgment or interaction is not involved, it can be categorized as automated marketing decision modeling I recognize that there are many types of models, including those that blend judgment and those automated, however, as a class, they represent a set of analytics or decision support tools that are intended to systematize a process to aid decision making

Research implications Three research implications follow from Observation 3 and the description of knowledge types First, certain types of knowledge "map" to particular organizational roles For example, concepts such as market orientation, brand equity, and customer lifetime value are likely to be more relevant to senior-level marketing and general management practitioners because these concepts are fundamental to their charter Conversely, very specific tools (e g , market research methods, quantitative models) may be more applicable to positions whose scope of responsibility is technically oriented The research agenda question that stems from this line of thinking is, How does the typology of knowledge map onto the various marketing positions within the firm? More specifically, one could examine whether tools, for example, are more useful for junior practitioners and whether concepts are most relevant to senior practitioners

Second, managers have different knowledge needs that are contextually triggered These knowledge types map onto different context-dependent needs To illustrate, a CMO client at a high-tech company was fundamentally concerned about the right allocation of marketing dollars across a host of media vehicles He was looking to find the optimal mix given his industry and environmental context Here, specific findings, or even an optimization model, would have been particularly helpful At a biotech firm, the management team was interested in finding ways to "play the game differently" around a product launch relative to the traditional approach of flooding the market with pharmaceutical sales reps In this situation, Monitor's work on "driving markets" (the concept and framework) allowed these managers to see the world differently and break out of the traditional go-to-market assumptions This leads to the question of when a manager or team should search for conceptual guidance versus "answer-oriented" information or tools

Third, I believe that concepts have a longer-lasting impact than other knowledge types That is, the more actionable the knowledge in the short run, the greater is its half-life Information about how to enter the Chinese market today will be less useful as time passes and environments change In a sense, research findings are frequently historically bounded Moreover, these findings are often related to a single decision, one that may be made only once or a few times in a career Thus, I believe that concepts or interrelationships among concepts that challenge the conventional view are the most influential knowledge for senior managers—not immediate, spot market findings The notion is that concepts can be reused many times and often form an orientation or philosophy about how to approach an issue, challenge, or job task Finally, every practitioner has a set of tools in his or her workbench, well-wrought tools are adopted quickly because they enable the organization to standardize activities and vocabulary My sense is that in the overwhelming majority of cases, the concepts precede the tools in development

Thus, in designing role-relevant research, it is necessary to figure out whether the purpose is to affect decision making today or to shape the general mind-set of the practitioner Furthermore, with respect to the mind-set approach, it has been my observation that the most impactful business concepts are those that provide a broad orientation or umbrella perspective under which a family of concepts reside This umbrella is not a theory but rather a point of view on how to think broadly about an issue Good examples are "built to last," "competing for the future," "value chains," and "profit pools " Each of these umbrellas contains several concepts that support the point of view For example, in the built-to-last perspective, there are concepts related to leadership, visioning, and human resources The highest aim for academics is to discover new theory, but I would advocate identifying umbrella points of view as an equally worthy endeavor Indeed, these points of view may be a precursor to the development of a new theory

In summary, this section can be categorized into five guiding questions that form the basis for developing role relevant research, which I summarize in Figure 2 Step 1 is to identify the target manager Once an organization position is identified, Step 2 is to identify the role task that will be the focus of the inquiry Next, it is necessary to identify the time frame (Step 3) and nature of impact (Step 4) Finally, the type of knowledge that will best achieve the desired impact can be selected (Step 5)

FIGURE 2
Developing a Role-Relevant Research Approach: Five Guiding Questions

The Five Questions	Illustrative Options
Who is the target manager?	Chief Markteting Officer or Brand Manager?
Which role task is the focus of the research?	Decision to Focus on Role Requirements "A" Versus "B"
When is the impact expected to occur?	Present or Future Time Period?
What is the desired impact?	Thinking or Action?
Which information will acheive the desired impact?	Research Finding or Conceptual Framework?

Applying Observations to the CMO Position

Because my first observation focuses analysis on a specific role, I have chosen to focus on the CMO position I selected this role for two reasons First, for the past ten years, I have been working closely with people in this role in a diverse set of organizations, including life sciences, agribusiness, high technology, and financial services These were frequently multiyear organizational transformation efforts Thus, I was able to observe the patterns of work behavior and "relative effort" applied to various tasks over a long period of time Second, this is a particularly interesting position within the firm As chief marketer, this person can shape the marketing philosophy, approach, and processes of the organization On the basis of my experience, as well as a review of the literature, I identified seven core tasks of the CMO While certain tasks are well addressed in the literature, other tasks have hardly been examined by marketing academics Thus, this step alone enables us to "see" gaps in marketing knowledge relative to this organizational position

Seven Primary Tasks

The role of the CMO can be quite varied, from a broad overseer of sales and marketing to one who performs a more narrowly defined, bounded set of traditional marketing communication activities (Quelch and McGovern 2004) Even with this range of executive scope, it is possible to identify seven core tasks, which in turn can be broadly categorized into the three areas strategy, organization and implementation, and monitoring/controls To be clear, these may be viewed as normative tasks that represent the minimum set of CMO responsibilities These tasks are based on a review of key literature (e g , ANA & Booz Allen Hamilton 2004, The CMO Council Report 2007, Ganesan, Malter, and Webster 2004), as well as my experience In what follows, I describe each of these tasks

Strategy With the strategy area, the CMO engages in three broad tasks (1) establishing the role of marketing in the firm (often as a result of multiple dialogues/negotiations with the chief executive officer [CEO]), (2) owning the voice of the customer (segment) and market (not simply customer) intelligence more generally, and (3) overseeing the overall marketing strategy, including corporate marketing strategy, business unit marketing, and product-/brand-specific marketing programs (e g , the traditional four Ps) While each of the three tasks may be manifested in unique ways across organizations (e g , there may not be a corporate marketing function, the role of marketing may be firmly established by previous CMO), all three tasks must be, at a minimum, acknowledged and made explicit by the CMO

First, the CMO must establish the role of marketing within the firm Although conventional marketing textbooks appear to take as a given the role of marketing within an organization, I have observed a wide variety of potential roles For example, in some cases, marketing has little influence on new product design, pricing, and selection of the distribution channel Instead, marketing activities are limited to marketing communications support for field sales reps In other firms, marketing "takes what research and development (R&D) produces" but can play an active role in the choice of segments, positioning, and marketing program elements (e g , pricing) Finally, in yet another set of firms, marketing is the key catalyst for innovative products and new market entry

Regardless of the exact role of marketing, the CMO must firmly communicate the boundaries of marketing, the tasks of marketing, and the decision rights around various key marketplace choices within his or her firm In effect, there is no one right way to do marketing, however, once the boundary conditions are established, it is the CMO's responsibility to ensure that all members of the marketing organization—and the organization more generally—know the role of the marketing function within the firm

Second, the CMO must own the voice of the market, including the voice of customer segments Marketing owns the aggregated voice of the customer at the segment level and plays a role in the boundary-of-the-firm market intelligence activities (e g competitor analysis) For most business-to-business firms, the voice of individual customers in the marketplace is the responsibility of the individual sales representatives (e g , call reports) When the marketing organization is credible and powerful, the organization turns to marketing to hear about the voice of the market As the most senior marketing executive, the CMO has the responsibility to ensure that the organization provides unique insights that can be exploited to gain competitive advantage It is not simply gaining new knowledge per se about the market, rather, it is about unique, asymmetric (i e , competition does not possess it) knowledge that the firm can exploit The CMO ultimately must take responsibility for the quality, efficiency, and advantage-granting elements of this voice Surprisingly, it is often the case that marketing does not own the voice of the customer in the firm and is often a weak function in the corporation

Third, the CMO is responsible for marketing strategy Marketing strategy includes the formulation of program goals, the choice of key segments, the development of the market position, and the articulation of the marketing mix Responsibilities include establishing a common set of processes and vocabulary for marketing strategy development, setting clear timelines for deliverables, and evaluating the quality of the plans This role is perhaps the best understood and most documented of the seven core tasks

Organization and implementation While the marketing literature in the past 15 years has begun to focus on the organizational issues—how marketing is organized (Workman, Homburg, and Gruner 1998), how marketing is linked to other functions (Homburg, Workman, and Krohmer 1999, Ruekert and Walker 1987), marketing's role within the firm (e g , Moorman and Rust 1996, Webster 1989, 1992) and the capabilities and processes needed to effectively function (Day 1994)—comparatively less research has focused on this area relative to the strategy and monitoring domains A significant portion of the CMO's time (in my experience, more than 50%) is spent on organizational and implementation issues, such as coordinating with other areas of the firm (e g , reporting to executive committee, working cross-functionally), running the marketing organization, and implementing transformation efforts to get the organization ready to compete in the future Next, I briefly describe these tasks in greater detail

A fourth primary task of the CMO is to coordinate the marketing activity with other units in the firm to support the CEO's agenda Clearly, the overall business strategy and associated "CEO agenda" provide both the direction and guardrails for the marketing activities This coordination with senior positions (or functions) may be considered the "upward" or "vertical" communication and coordination activity It is often accomplished through executive or leadership committee meetings with other C-level executives or through business-planning activities, such as the "long-range planning" process or even yearly budgeting process Equally important is the "horizontal" coordination of marketing efforts with other key functions of the firm For select firms, the integrating mechanism is often the R&D pipeline (or technology roadmap) committee meetings

Fifth, the CMO runs the marketing organization That is, the CMO is responsible for establishing and reinforcing marketing processes, procedures, systems, capabilities, decision rights, and rewards to "run the marketing organization " Running the organization effectively requires a combination of industry knowledge, marketing "content" knowledge (e g , What does a good brand plan look like?), organizational behavior and design expertise (e g , conflict resolution), and financial acumen (e g , managing the profit and loss, making sound investments) Often, the most important element of this effort is making sure that one has the most competitive human resources system—namely, the recruitment, selection, management, and development of marketing talent

Sixth, the CMO needs to identify and lead key marketing transformation efforts Every CMO that I have worked with has identified and prioritized a small set of strategic initiatives that are designed to help the marketing organization compete as the industry and market changes For some organizations, these initiatives are about embedding a stronger brand-planning process, for others it is about strengthening the human resources bench, and for others it is about transforming from old media to new media Regardless of the issue, these small numbers of initiatives can be thought of as "change management campaigns" designed to better compete to changing market conditions

Monitor and controls The seventh primary task of the CMO is to develop a scorecard to assess marketing performance and to establish return-on-investment (or free cash flow) metrics While financial targets tend to dominate these discussions, nonfinancial measures are widely deployed as leading indicators of progress These nonfinancial measures are often grouped into human assets, operations, and customer categories

In addition to establishing the scorecards, the CMO must also solidify the marketing strategy (see the third task) and align the organization (see the fifth task) to deliver against the scorecard This often entails meetings, audits, budget reviews, and operational review to track progress against desired targets Importantly, other functions of the firm are either consulted or part of this review cycle Moreover, these metrics are also discussed in the course of coordination with other functions of the firm (see the fourth task)

Summary The CMO is responsible for seven core tasks that, in turn, can be organized into strategy, organization, and monitor/control elements Although the extent of time allocated to these tasks varies by industry, organization, and individual preferences, all the tasks are part of the CMO's overall responsibility The CMO is not a sole agent operating at his or her discretion, rather, all these activities need to be highly coordinated with other areas of the firm and with the overall strategy pursued

Knowledge Gaps

The central thesis of this article is that academics must have a very deep, rigorous understanding of the firm roles (e g , the CMO role, as I have described in the preceding subsection) and must craft research programs to fill the gaps where knowledge is limited or insufficient I refer to this as "role-relevant" managerial research To assess the impact of CMO-relevant research to date, I have constructed a table that identifies the seven key tasks, the level of academic research to date, and illustrative research questions (see Table 2) Given the CMO role description, my assessment is that the strategy and metrics components have received steady attention over the past 30 years We can argue about impact and gaps within these areas, but I believe that solid progress has been made However, other areas have received significantly less attention In light of space limitations, I restrict my analysis of Table 2 to the three most significant gaps (i e , the low scores in Column 2)

Gap 1 Establishes role of marketing in the firm

Table 2 notes that there is an insufficient understanding of the role of marketing within the firm (Column 2) As a result, we need explore questions and issues related to this gap While certainly exploratory, I provide a few illustrative questions (Column 3) For example, in my experience, the majority of senior marketing executives have deeply rooted, strongly held "theories-in-use" about how their world works In effect, they have a mental model of how the marketing machine works in their organization They may believe strongly in building global brands, owning the channel, or maintaining the lowest cost structure in the industry Furthermore, these belief systems are based on years of work experience, failures and successes, interactions with other executives, and observations of innovations in the industry These belief systems are also formed by business writing or exposure to new ideas through execu-

TABLE 2
Establishing a Research Agenda for the Chief Marketing Officer Role

Seven Core Tasks	Level of Current Knowledge	Illustrative Research Questions
1 Establishes role of marketing in the firm	Low	a What are the various roles for marketing in the corporation? b Are there dominant philosophies or schools of thought for marketing? c How does marketing gain more power in the firm when other functions dominate?
2 Owns voice of market	Medium	a What are the most effective tools to gain unique customer insight? b What is the best approach to aggregate competitor intelligence in the organization? c How do we share the voice of the market with other functions of the firm?
3 Responsibility for marketing strategy	Medium–High	a What are the essential ingredients of a marketing plan? b How does one embed new decision support tools? c What is the optimal blend of new and old media?
4 Coordinates marketing with other areas of the firm	Low	a What are the most effective ways to coordinate marketing, sales, and R&D? b What are the key "operational review" metrics for coordination? c Where does the commercial system break down and how do you get it on track?
5 Runs marketing Organization	Medium	a What are the essential marketing capabilities to compete in the future? b How do marketing processes link to other functional processes? c How does talent management in marketing differ from other areas?
6 Identifies and leads the marketing transformation effort	Low	a What are the key success factors in leading marketing change? b Are there specific marketing levers that need to be managed? c What is the role of the marketing leader in driving change?
7 Establishes marketing scorecard and performance metrics	Medium–High	a Is there a balance scorecard for marketing? Does it vary by industry? b What are the right measurement instruments to deploy?

tive development. Indeed, it is not unusual for a senior marketing executive to reference one of his or her favorite books, articles, concepts, or thought leaders in the course of one of Monitor's multiyear transformations.

It is difficult to pinpoint the exact term to classify these higher-order belief systems, though three terms in particular come to mind: a philosophy, school of thought, or worldview. By analogy, if you ask a marketing academic who they are and what drives them, they may begin the conversation with higher-order classification ("I am a behavioralist or modeler"), then identify streams of research interest, and finally note the actual research papers. In a senior vein, marketing executives have a philosophy, orientation, and set of priorities (some implicit, some explicit) that guide the core marketing decisions that are downstream (e.g., segmentation, positioning, pricing). For Merck's marketing organization, the idea that the "the patient always comes first" is one of several principles that guides behavior, choices, and resource allocation in the field. While not a philosophy in itself, it is a principle that precedes market planning. We have largely ignored these guiding principles or worldviews in favor of the straightforward aspects of marketing analysis, planning, and control.

Another way to think about this issue is with respect to schools of thought. In economics, one can follow a Keynesian or Chicago school, implying that there is a particular set of "general principles" or even theorems to guide a person's view on how the world operates. These are exceptionally important beliefs or orientations that structure a person's downstream decisions, choices, and resource allocation. To the best of my knowledge, there are no "schools of thought" or "philosophies" of marketing that represent the alternative "theories in use" of senior marketing practitioners.

Gap 2: Coordinates marketing with other areas of the firm.

Over the past 30 years, there are many examples of research on marketing organization (e.g., Workman, Homburg, and Gruner 1998), implementation (e.g., Bonoma 1982), interrelationships with other functions (e.g., Cespedes 1995; Ruekert and Walker 1987), and the role of the marketing function (e.g., Moorman and Rust 1999). However, collectively, this work is nascent. This is not a critique of the particular research articles. Rather, if we accept my armchair observation that 50%–70% of the time the CMO is working on organizational issues, and less than 1% of the marketing management literature focuses on the coordination with other areas of the firm, then we can observe a gross "practice versus literature" trade imbalance.

Equally important, virtually all articles focus on organizational variables and do not give any in-depth attention to the leadership challenges that CMOs confront in managing interfunctional challenges. Frequently in high-tech companies, marketing is the third weak leg of the R&D, sales, and marketing triad. How exactly does the CMO increase the legitimacy of the marketing organization? For a CMO client of a well-regarded, strongly branded high-tech company, the route to gain legitimacy was through the standardization of the market-planning process and to attempt to "own" the voice of the market relative to the highly powerful R&D organization. As it stood, R&D drove product development and innovation, and marketing was largely relegated to sales support. Through a multiyear effort to standardize the market-planning process (including the gathering of deep, novel customer insights and trends), the CMO was able to reverse the power distribution through the introduction of novel customer insight and, as a result, fundamentally reshaped the strategy of the firm. For this issue, I could imagine that research findings that illustrate how to build more legitimacy for marketing or how to shift the power base would be very helpful to CMOs in the situation just described.

Gap 3: Identifies and leads the marketing transformation effort.

As I noted previously, CMOs are concerned not simply with the next 12–18 months but also with what it will take to compete in three to five years. Indeed, there is significant anxiety about how to change the organization and "get to the future." For some organizations, there are large-scale macroeconomic issues (e.g., sustainability, rise of China) that create this fear, but for others, it is as simple as experiencing enormous price pressures that will "commodify" their offerings if they do not figure out how to reposition some of their most profitable products.

To the best of my knowledge, the marketing literature has missed this issue entirely. There are books on leading change (Kotter 1996) and creating the future (Prahalad and Hamel 1994), yet they often focus on organizationwide transformation on a very general level. Certainly, there is much to learn from these authors. However, there are marketing-specific levers that need to be managed in the change effort. Indeed, because marketing spans boundaries between the organization and the marketplace, my presumption is that it is much more complicated to make the change happen for the marketing organization, because there are host of exogenous factors that influence its evolution.

The purpose of this section has been to show how the three observations could be employed to surface "gaps" and to identify research questions to fill the gaps. Again, my approach is illustrative—a similar exercise could be done for any marketing position. The key to populating Table 2 was a great deal of exposure to the world of CMOs. In the next section, I describe a few approaches that can facilitate this deep exposure.

Roles of Knowledge Providers and Users

The responsibility to produce and consume role-relevant research is a joint responsibility shared by both academics and thoughtful practitioners. While we often associate managerial relevance with the "production side" of this equation (i.e., the academic), the reality is that change must also occur on the consumption side (i.e., the manager). It is comparatively easier to produce work that is exceptionally easy to consume—*The One-Minute Manager*, "management by walking around," and *Who Moved My Cheese?*—but such work rarely possesses the necessary empirical foundation or tight conceptual rigor to withstand serious debate. Thus, the thoughtful manager has a responsibility to be, well, thoughtful. That is, to challenge him- or herself intellectually by reading more substantial, theory-based work (e.g., Ariely 2008; Cialdini 2001) and to build a personal network of thought leaders and publications to test and stretch his or her mind-set. Moreover, managers need to make their role more clearly understood by the academic world. In the following subsections, I begin with the role of the academic and conclude with implications for managers. That said, the recommendations for each audience is based on a similar process: spending time to learn, engaging in two-way communication to build the relationship, and finally presenting (or consuming) research.

Knowledge Providers: Academics

There are several essential steps for building a programmatic, managerially centered research stream: (1) spending a significant amount of time in the world of the target practitioner, (2) reflecting broadly and from multiple vantage points about that world, (3) engaging in two-way interactions within their world, be it face-to-face, through blogs, or with other forms of two-way communication, and (4) "pretesting" ideas with practitioners.

I begin by discussing "what I don't mean"—namely, doing research that entails reading a significant amount of literature, forming some initial hypotheses, talking with a handful practitioners, field-testing the questionnaire, collecting the data, and analyzing the data. The problem with this approach is that it feigns a level of insight into the phenomena. Consider the reverse. If a thoughtful manager conducts multiple interviews with academics about "publishing" in the top journals, would he or she leave with a deep understanding of the process of publishing in top-tier academic journals? If the answer is yes, the good news is that this reduces the standard marketing PhD program from five years to a little more than a few weeks. So, what can we do to connect more intimately with the actions and minds of marketing practitioners?

Spending time. I am not sure I agree with Malcolm Gladwell's (2008) observation that it takes 10,000 hours to develop expertise, but let's say that he is in the ballpark. So, assume that the typical managerially oriented academic spends 30 days a year in the executive classroom, 10 days a year conducting depth interviews, and another 10 days in conversations with thoughtful practitioners. This means that 50 days × 8 hours, or 400 hours per year, is spent in the managerial world. So, assuming 25 years of effort, one can pass the expert bar when one is ready for retirement. My point is that running executive education sessions and talking with executives does increase level of expertise—but let's not overestimate our level of understanding. So, the key point is to ask yourself, How much time would the practitioner need to spend with you to understand the world of top-tier, peer-viewed publishing? And hold yourself to a similar standard.

Multiple vantage points. Each manager has a biased and unique perspective on his or her own world. In effect, it is a small numbers game for each practitioner. So, along the way, it is important not to overplay any individual observation. We must be much broader than a "day in the life" of the manager. Rather, think about a "month in the life" or a "year in the life" of a manager. This would render it necessary to consider things beyond the present, action cell and to think about the multiple forces at work on a given position—How does the CEO think about the role of the CMO? What about peers, such as the chief financial officer, the chief operating officer, or a senior vice president of sales? What about subordinates or peers outside the organization?

Two-way interaction: insights and blogs. Rather than thinking that working papers and reprints are the best way to interface with managers, why not include "insights"—or short, one-paragraph summaries for students and practicing managers. If the entire discipline developed these "insight summaries," managers could search the web for relevant insights for their pressing problems. Indeed, it would be great to see the emergence of "manager-friendly blogs," in which a given researcher writes a research-based column on business-to-business marketing—key insights that are similar in spirit to the *Harvard Business Review* summaries.

Managers as "test sites." It would be helpful for a researcher to develop a small set of thought practitioners who represent a "test" or "alpha' site for idea development. We have all experienced the process of evolving and upgrading a lecture in real time, as the process unfolds. That is, the first delivery is used as a test market for the idea, which is then refined accordingly. My recommendation is to find a handful of executive "friends" who are willing to play this role. In the best of worlds, the academic would provide the logic flow for the "insight summary" and then ask, (1) Does it hold water? (2) Can you provide support examples? and (3) Can you provide counter examples?

Knowledge Users: Executives

At a superficial level, my advice for practitioners is simple: (1) Expose yourself to deep ideas, (2) develop a set of academic market mavens who act guides to the marketing academy, and (3) challenge yourself by experimenting in the field. While each of these ideas represent my primarily message, I add some details and nuance to each of these three broad recommendations in the following discussion.

Spend time and expose broadly. In my experience, when someone rises to the ranks of CMO, this person is not only savvy in the business world and very smart, but he or she can think conceptually. This ability to think conceptually should be the goal of all managers who want to move up the corporate ladder. So, how is this accomplished? There are no easy answers, but a starting point is the managerially oriented top-tier manager journals, such as *Harvard Business Review*, *Sloan Management Review*, and *California Management Review*. Marketing-specific reports such as those provided by the Marketing Science Institute, ISBM, and other centers also produce relevant knowledge that is easily digestible.

I believe the most important advice is to target a specific aspirational role in the organization and closely examine the role requirements. What are your knowledge and experience gaps relative to these core tasks? While the experience gaps are not completely under your control, the knowledge tasks can be filled (to a degree) by reading, executive education, attending conferences, mentoring, and other forms of knowledge dissemination

Two-way interaction market mavens Market mavens are people who love to connect and share information about their specific domains of knowledge (Feick and Price 1987) The notion here is simply to develop a relationship with someone who has deep expertise in an area that is highly relevant to your practice This can happen directly, by reaching out to faculty members whose work you have read, or indirectly, by visiting key research-based centers (e g , Institute for the Study of Business Markets at Pennsylvania State University, the Center for Service Excellence at Arizona State University)

Experiment in the field "test sites " While exposing oneself to new information and knowledge is a great first step, it is biased toward thought and does not address the need to take action in organizations Because my focus here has been on both thinking *and* acting, my recommendation is to conduct "field experiments" to test some of the ideas My advice here is not necessarily to generate new knowledge but rather to conduct field tests of ideas to assess their degree of managerial relevance in your firm For example, Itamar Simonson's (1989) work on pricing, which shows that the mere presence of a higher-priced wine on the menu increases the consumption of the moderately priced wine, is an example of a possible idea to test in a retail environment It does not mean the manager needs to change the entire pricing structure, rather, he or she can conduct a test in a particular district to determine whether the knowledge can be applied in the work context The manager could then reconnect with the academics who produced the knowledge to complete the "research-use" cycle

Conclusion

Managerial relevance is about the manager Research needs to be role relevant and targeted to the various roles that marketers perform in an organization The organization ultimately benefits from more effective deployment of knowledge, but the correct unit of analysis is the individual person Rather than spread resources across a host of industries, thorough knowledge of a position in an industry will enable one to discover new concepts and ideas rather than reexamine existing concepts Importantly, managerially relevant work is not for everyone I fully acknowledge that diverse viewpoints on managerial relevance are healthy and valuable Indeed, these diverse viewpoints and approaches will ultimately strengthen work on managerial relevance, not diminish it

How does one start the journey? I am sure that some readers will conclude that this work is simply too time intensive and will take away from the limited pool of research time Given the need to publish, the idea of spending a significant amount of time with managers sounds good in principle but will never be realized Thus, we will continue to observe the acceleration of nonuse and irrelevance, as expressed by Reibstein, Day, and Wind (2009)

In a curious way, it is similar to a technology client of mine whose R&D function believes that it knows the voice of the customer—and as a result spends little time in the market In this firm, the R&D function does not review market research reports, talk to sales reps in the field, or observe everyday actions of their target customers They are simply too busy working in the lab to find the time to talk to customers We all look at this situation and conclude that the answer is the need for a fundamental shift in R&D's worldview of how "things work today " That is, R&D must completely shift its mind-set first, otherwise, any change effort is likely to be temporary

So, how does this mind-set shift happen in firms? This big mind-set shift often happens when one firm—or product area within the firm—plays the game differently and exploits unique customer insights The word then gets around and change begins to happen from the ground up In a similar vein, I believe that only a handful of marketing scholars need to implement the suggested "role-relevant" approach and publish one or two interesting articles that introduce completely new concepts to the literature In turn, these articles would be the catalyst for the broader change to occur in the field While risky in some respects, the alternative is the status quo, which "has gone beyond the familiar dilemma of academic research pitted against practical relevance [to a] widening divergence [that] has become detrimental to the long-term health of the field" (Reibstein, Day, and Wind 2009, p 1) So, we can continue along the same comfortable, well-worn, and increasingly marginalized path, or we can play the game differently

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Richard J. Lutz

Marketing Scholarship 2.0

The system for the design, production, and dissemination of marketing scholarship aimed at contributing to marketing practice is under increasing strain due to pressures exerted by globalization, digitization, and environmentalism. Scholarly research in marketing adheres largely to a twentieth-century manufacturing model. Change is needed now. Marketing scholarship can benefit from embracing a twenty-first-century, collaborative approach to the conception, design, and dissemination of research. "Crowdsourcing" is becoming a frequently employed strategy in industry. Marketing academe should adopt some of the same techniques and technologies to make stronger research contributions that will benefit marketing practice. In particular, more collaboration is needed, both among academic researchers and between academe and industry, to be sure important problems are being investigated using sound theories and methods. An open, collaborative model will allow the field to evolve from Marketing Scholarship 1.0 to Marketing Scholarship 2.0.

Keywords: scholarship, open source, Web 2.0, academics, practitioners

What if the marketing discipline collectively decided to sit down and devise an effective system for advancing marketing knowledge and practice? The focus of this system would be the identification of important marketing issues, the production and dissemination of research that addresses those problems, and the effective utilization of this research knowledge by marketing practitioners. What are the chances that this "designed-from-scratch" system would look anything like our current system? In many respects, our knowledge production and dissemination, though time-tested, is analogous to a twentieth-century manufacturing process: closed (think double-blind reviewing), linear, and slow.

In contrast, marketing practice worldwide has embraced the concept of a more collaborative model and is moving rapidly to deploy it. "Crowdsourcing," generally understood as outsourcing previously internal processes to the public and encouraging participation (Howe 2008), is cropping up in dozens of marketing organizations. From product designs to ad campaigns, companies and brands such as Dell, Starbucks, Frito-Lay, Nike, Netflix, Unilever, Threadless, Honda, Trek Light, NASA, IBM, and Procter & Gamble have turned to crowdsourcing.

The purpose of this article is to explore the implications of the changing environment and newer collaborative models for marketing knowledge production and dissemination, with particular emphasis on our academic journals. I begin with a brief review of environmental impacts on the publication process, followed by a discussion of digitally inspired trends in other scholarly domains. I conclude by offering some proposals for what "Marketing Scholarship 2.0" might look like. Some of these proposals may seem a bit radical; others are almost certainly not radical enough. It is difficult to overestimate the rate at which change is occurring. It is clear that change is needed now, not years from now. We don't really want to be at the helm of the next Kodak or General Motors.

Environmental Impact on Marketing Scholarship

The first decade of the "New Millennium" has brought with it a dazzling array of changes to the marketing landscape. We have witnessed the emergence of a truly global economy, with China and the other BRIC countries (i.e., Brazil, Russia, and India) nipping at the heels of the United States for global economic leadership. The impact of the Internet is being felt in virtually every aspect of our global society, from where we shop, to where we get our news and entertainment, to where we find our friends and even our spouses. Climate change has accelerated and has energized some of our largest firms to take steps toward becoming more sustainable enterprises.

While these trends are well-known as critical developments in the general marketing environment that affects firms both large and small and across all industries, it is also clear that these trends have been manifesting their effects in the domain of marketing scholarship. Not just *what* we research, but *how* we conduct research, disseminate it, and access it are changing. The current twentieth-century system of knowledge production, dissemination, and utilization is under unprecedented strain. An overhaul is needed that will move the model for marketing scholarship into the twentieth century.

Over the past decade, *Journal of Marketing* has experienced an explosion of growth in terms of manuscript submissions. From January 1, 2000, through June 30, 2009, the journal received 4205 new submissions. Most of this growth has been fueled by the joint effects of the globaliza-

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tion of business education and the digitization of the journal submission and review process As business schools worldwide mature and embrace the importance of scholarly publication by their faculties in the field's most prestigious journals, marketing scholarship has become more globalized, with the participation of hundreds of new scholars

Without access to the Internet, many of these international scholars would face substantial barriers to publishing in U S journals, but the technological barriers are down, and marketing scholarship is more broadly participative as a consequence Submissions to *Journal of Marketing* have doubled in the past decade

Although perhaps driven more by economic constraints than a mandate for becoming "greener" per se, libraries, the traditional customers and repositories of print journals, are nonetheless evolving toward a more electronic future Many university libraries are severely budget and space constrained and regard the print form of professional journals to be more of a (costly) nuisance than a benefit (McKay 2009) Their real need is for online access for their constituents On a per-use basis, electronic access is far more cost efficient for the library and more environmentally friendly The online, "open access" (OA) journal movement, which I discuss in greater detail subsequently, is being embraced by scientific and professional journals across virtually all disciplines As marketing scholarship continues to globalize and become more sophisticated, it is inevitable that the demand for journal pages will accelerate *Journal of Marketing* published 512 pages and 27 articles in 2000, by 2009, those figures were 864 pages and 61 articles (including a special section funded by the Marketing Science Institute [MSI]) Similar growth has occurred at other leading journals in the marketing discipline, as well as other related disciplines (McKay 2009)

Impact of Marketing Scholarship on Marketing Practice

> "You people don't do real research You *think* you do research, but you don't "
>
> —Anonymous university president addressing business school faculty

Why would a major research university president say such a thing to the faculty of a highly ranked public business school? Among the various possible answers to this question, the most charitable interpretation is that the president in question judges something as being "real" research only when it generates indirect expense (i e , overhead), a large part of which is captured by the central administration

However cynical the president's assessment may have been, it does raise an important issue—perhaps *the* important issue—facing scholarly research in marketing Who, exactly, are the constituents for our research? Extramural (funded) research of the type favored by the president has no difficulty answering that question The most obvious, and immediate, constituent is the funding entity, whether it is a private foundation, a corporation, or a government agency The funding is granted because the funding entity is interested in the outcome of the research, research relevance is guaranteed, or the researcher's funding will evaporate

Academic marketing researchers seldom face this sort of built-in constituency Very little of our research is funded by outside parties (MSI is a notable exception) Thus, many researchers pursue their projects without as clear a "market definition" of the eventual "potential customers" of their research as is desirable, especially when the intended audience is marketing practitioners As Daniel (2009, p 3) notes, "it's commonplace to hear businesspeople scoff that academic research never has any influence on what they actually do in their companies Legal, medical, and engineering journals are written and read by lawyers, doctors, and engineers, but business journals consist almost wholly of articles written by professors for other professors " Judging by the typical 85%–90% rejection rate at the field's leading journals, it might be tempting to conclude that academic marketing researchers do not even understand the needs and preferences of other academics! Armstrong (2003, p 71), one of the most persistent critics of academic marketing research, puts a sharp point on the issue "Few papers in marketing journals would fall into the category of having findings that are useful, especially in the more prestigious journals " He further poses (p 71) the question, "Do researchers in marketing consider usefulness when they decide on research topics?" His conclusion is that they do not

It is my contention that marketing academe needs to improve the relevance of its research to *some* constituency (whether practitioners or other academics) without sacrificing rigor I further contend that this improvement can be accomplished by adoption of a more collaborative, "Web 2 0" research model at the conception, design, review, and dissemination stages of the process Although the production of knowledge obviously precedes its dissemination, for expositional purposes, it is easier to discuss them in reverse order here Thus, I begin by turning my attention to the dissemination stage of the scholarly research enterprise This is followed by a consideration of a more collaborative approach to the conception, design, and review of marketing scholarship

Dissemination of Marketing Scholarship

Although the content of marketing scholarship—most notably the choice of the problems to investigate (to be discussed in the following sections)—is of paramount concern to a vital research enterprise, opportunities exist for improving the dissemination of scholarly research Adopting a "four Ps" analogy, knowledge content is the product, while dissemination encompasses the place and promotion elements Assuming that useful content has been developed, dissemination becomes equally important

Unfortunately, the track record for effective dissemination of marketing scholarship intended to contribute to marketing practice has not been strong, at least not from the perspective of the intended recipients Arguably, the two primary routes through which academic marketing research is disseminated are professional journals and professional (academic) conferences Neither of these media is favored in the practitioner community In a recent study conducted in New Zealand by Gray, Ottesen, and Matear (2005), academic conferences and academic journals ranked seventh and eighth, respectively, out of eight business media (Printed reports, CD-ROMs, and seminars were the top three media) At the risk of extrapolating beyond the sample of New Zealand managers, it seems safe to conclude that journals and academic conferences would not fare much better in the United States Clearly, a better "distribution" method is needed

From the academic scholar's perspective, publication in one of the field's top journals (preferably an "A-level" one) is the "coin of the realm " Although the field's journals currently adhere to the "printed issue" model, it is evident that the real utilization of journal content is increasingly electronic Opening the door to electronic dissemination of marketing scholarship creates a wide range of collaboration and communication possibilities

Common Online Knowledge Dissemination Vehicles

In a recent survey commissioned by the Association of Research Libraries, Maron and Smith (2009) employed a team of 301 librarians at 46 institutions to interview faculty about their use of online scholarly resources for research purposes They identified 206 sources, which they then clustered judgmentally into eight categories

Electronic-only journals The most common online resource mentioned—across an eclectic group of scholars representing the humanities, social sciences, and science, technology, and medicine—was e-journals These e-journals are essentially the online analog to traditional print journals They have clear editorial missions and guidelines and, importantly, are peer reviewed (Harnad 1996) A hallmark of e-journals is their OA character, which permits unlimited public access to the work I devote more attention to OA publication subsequently, but for now, suffice it to say that its primary perceived advantages by scholars are more immediate access to current scholarship for the readers and increased citations for the authors In the early days of OA publishing, many scholars had concerns about the credibility and prestige of OA journals, however, as long as a journal adheres to a rigorous peer-review process, those early concerns are mitigated For example, *PLoS* (Public Library of Science) *Pathogens*, an OA journal founded in 2004, has an impact factor of 9 and is widely regarded as publishing the best work in the field (McFadden 2009) Open access e-journals are an important trend across a wide range of disciplines and appear to have great potential significance for the marketing discipline

Reviews Particularly in fields in which scholarly monographs are an important vehicle, online reviews have emerged as a very current source of information about new scholarly works The journals in the field of marketing traditionally have featured book review sections, but most of the featured books are either trade-oriented or textbooks Thus, although online reviews are not as important to marketing scholarship as they are in other disciplines, the much faster access relative to reviews appearing in a print publication is a clear advantage Adopting a somewhat broader view of scholarship to embrace trade and textbooks, it would be useful for the American Marketing Association (AMA) to host a book and monograph review website Currently the AMA Foundation awards an annual prize (the Berry-AMA Book Prize) to the best trade-oriented marketing book Rather than just this annual award, candidate trade books and monographs could be reviewed as they are released True to the collaborative model being espoused here, the review website would permit and encourage commentary on both the books and the reviews

> Recommendation 1 The AMA should establish an online book review forum Reviews of new marketing-related books should be posted on a timely basis, and interactive discussion should be promoted

Preprints and working papers In this electronic age, numerous mechanisms exist for scholars to share their prepublication work, most notably through e-mail and personal websites and increasingly, academic institutions' repositories However, as Maron and Smith (2009) note, some public servers exist that offer even broader access For example, the Social Science Research Network (SSRN) houses nearly 250,000 downloadable working papers It is also common for OA journals to post preprints of work that has been accepted but not finalized for publication

> Recommendation 2 Marketing scholars should post their prepublication working papers in their institutional repositories, if available, and on SSRN

The marketing discipline has been slow to embrace this vehicle For example, at the time of writing, only 2866 marketing papers were on SSRN, compared with more than 84,500 finance papers (http //www ssrn com)

Encyclopedias and dictionaries The basic idea of this resource is analogous to Wikipedia org, except that entries are reviewed by scholars before they are posted The resultant resource is an authoritative compendium of knowledge in the field Such an online resource could be hosted by the AMA and would have the distinct advantage over printed encyclopedic collections of being dynamic and easily updated In addition, because no space constraints exist, unlike a print format, entries could be lengthier and could afford space for alternative viewpoints

> Recommendation 3 The AMA should host an online, authoritative dictionary/encyclopedia of marketing, using a wiki approach

Data resources In several disciplines, scholars are engaged in large-scale data projects designed to create an online repository of data that other scholars can access for their own research A particularly creative database effort cited in Maron and Smith (2009) is eBird, which aggregates bird watchers worldwide This "community data project" receives more than a million observations monthly The key to an online database, according to Maron and Smith, is functionality, the data need to be readily usable by scholars accessing the site The field of marketing could greatly benefit from a large-scale database that is open to all scholars Many of the most highly cited articles in marketing have used data that firms have supplied to the researchers (MarketingPower com 2010a, b)

Although many of these data sets are proprietary and the companies have been reluctant to share them widely, others have been shared a bit more broadly (e g , Information Resources Inc , panel data used by numerous researchers) However, by and large, access to marketing data is rather restricted Perhaps it will always be so, due to competitive forces, but as more scholars have the tools and skills to analyze large databases, having an online data archive that permits younger, less-connected scholars ready access would appear to be advantageous to advancing knowledge in the field

In a sense, this online resource deals more directly with the production of knowledge than with the dissemination of knowledge, but it clearly illustrates the value of collaboration by parties with differing resources (i e , databases and analytical tools) Institutions such as the AMA could "host" the data archives and manage a proposal review process to ensure that the access being granted was for scholarly purposes

> Recommendation 4 The AMA should host an archive of marketing-related databases that are available to academic researchers for scholarly research The data should be disguised as necessary to avoid revealing proprietary information

Blogs Web logs devoted to scholarly research are common in many disciplines and are regarded as effective for informal communication among scholars Most blogs are OA, and entries undergo no screening or formal peer review The primary benefit is the opportunity for a scholarly community to interact freely on topics of mutual interest Currently, the AMA hosts a moderated *Journal of Marketing* blog on its website, but to date it has not attracted a lot of activity It is not clear what the incentives are for an individual to post comments on a blog unless it is a high-profile site with a large or important audience

Discussion forums According to Maron and Smith (2009), discussion forums are one of the oldest forms of online scholarly communication Like blogs, discussion forums are informal and used more for informational purposes than for scholarly publication The ELMAR listserv maintained by the AMA is a good example However, similar to the *Journal of Marketing* blog, there is little or no real "discussion" taking place on ELMAR, its role is more informational If the discussion was more fully integrated into the journal itself (postpublication review and commentary), it may become more prominent and valuable to the community of researchers and users

> Recommendation 5 Encourage open commentary and debate

Marketing scholarship can benefit by becoming more interactive The 1988 report of the AMA Task Force called for more commentaries on journal publications to encourage scholarly debate and interchange When journal space is scarce, it is difficult to justify allocating several pages to commentary and rebuttal However, online journal space is essentially "free," which creates an excellent opportunity to encourage such interaction Although it may be desirable to have some sort of editorial "filter" on such exchanges, in the spirit of wikis and in the service of immediacy, an "open forum" approach would seem to be better approach This would operate similarly to the current model at the *Journal of Marketing* blog

Academic hubs A hub is a digital portal, most often hosted by a scholarly society, that provides "one-stop shopping" for scholars in a field At such a hub, an individual can find access to e-journals, reviews, preprints, blogs, databases, and other resources The AMA's Academic Resource Center (ARC) is an excellent example of an academic hub In addition to tabs for Conferences, Journals, SIGs (Special Interest Groups), and Awards, links are provided for Teaching, Research, Service, Career, and Connections Drilling down on the Research link, one finds links to an array of helpful resources, ranging from bibliographies of selected topics to useful software for conducting research According to former ARC administrator Charles Hofacker, utilization of the ARC research links is sporadic at best The ARC appears to be an opportunity that the AMA can capitalize on more fully in the future

Another important idea not considered explicitly by Maron and Smith (2009) is a more proactive mechanism for disseminating research results to interested parties, rather than a more passive approach of waiting for the audience to access the research

> Recommendation 6 "Push" knowledge contributions out to constituents

To achieve maximum impact of marketing scholarship, it is not sufficient to wait for the world to "beat a path to our door" Instead, proactive steps must be taken to "push" knowledge out to the marketplace of ideas For example, *Journal of Consumer Research* prepares a publicity release for every article it publishes Another useful approach is exemplified by the "Knowledge @ Wharton" e-mail newsletter, which features professionally written synopses of published articles by Wharton faculty as well as original commentary on important business issues of the day Knowledge @ Wharton currently boasts about 1 2 million subscribers, comprising a mix of academics and practitioners

The benefits of a more proactive promotional campaign on behalf of marketing scholarship will be apparent to anyone working in the field Ultimately, scholars engage in research to influence thought and gain recognition for their contributions It is in their best interest to have their work disseminated widely, through a variety of media It is also in the best interests of their employing institutions, whose rankings depend in part on the scholarly renown of their faculty

Online OA Journals

The OA movement began around the turn of the twenty-first century and has been accelerating the past few years Essentially, an OA journal provides free, immediate, and unrestricted access to journal content Content is created once, stored once in an online archive, and used a limitless number of times As with any published work, the author retains the rights to attribution In the OA domain, a distinction is made between the "gold path" and the "green path "

The green path The OA green path works in conjunction with existing print journals When a manuscript is accepted for publication, the author submits a copy of the article to an online open repository More than 500 universities worldwide are providing such repositories for research published by their faculty and PhD students, among others (Harnad et al 2008) Because the journal typically holds the copyright to the article, authors need to take care to preserve their right to post their research in a public forum Most journals cooperate with this process, but the SPARC Author Addendum (http //www arl org/sparc/author/) is available for authors to append to the standard copyright agreement if necessary The majority of OA journals currently follow the green path In a recent survey of more than 10,000 traditional journals (cited by Harnad et al 2008), over 90% reported that they were "green "

The gold path The gold path refers to exclusively electronic journals with no print counterpart Gold journals do not have subscription fees, they are freely available to anyone To support themselves, gold journals rely on a variety of mechanisms, including (most commonly) author publication fees of $2,000–$3,000 per article, sponsorships, and grants In September 2009, the Directory of Open Access Journals (DOAJ) contained 4344 journals, 93 of which were in the Business and Management category By September 2010, the DOAJ database boasted 5381 online journals (144 in Business and Management) There are an estimated 25,000 journals worldwide, which suggests that approximately 20% are "gold," and DOAJ reports that 10% of all peer-reviewed articles across all disciplines are OA (see http //www doaj org)

The OA imperative Although still in its infancy, the OA movement is rapidly gathering momentum as institutions throw their weight behind it Originally a grassroots movement, OA gained legitimacy in 2007 when the National Institutes of Health (NIH), the world's largest funder of nonclassified research, mandated that all NIH-funded research be OA (Suber 2009) Currently under debate, the Federal Research Public Access Act would require any institution receiving more than $100 million annually in federal research funds to provide its research in an OA format Sweden already mandates that all published research be OA (McFadden 2009) In 2009, the arts and sciences and law faculties at Harvard adopted OA, as did the Stanford School of Education Furthermore, in 2009, more than 30 established print journals "converted" to OA (Suber 2009) The Public Library of Science PLoS, funded by an initial grant of $9 million, is moving toward self-sufficiency

OA business models Given the nature of scientific publication, gold OA journals rely very little on advertising to replace subscription revenues Instead, the most common model is a publication fee charged to the authors These fees may be paid by the authors themselves, but more commonly they are paid out of the grants supporting the research or by the authors' institutions For example, University of California, Berkeley, devotes funds to paying publication fees (Suber 2009), and the University of Florida announced a similar OA funding initiative in 2010

The vast majority of OA journals are "green" and continue to charge for subscriptions, most often through a "big deal" offered by a commercial publisher or aggregator (Bjork and Hedlund 2009) Springer, which publishes more than 2000 academic journals, is the leading OA journal publisher (http //www springer com/aboutspringer) Under the green route, access to the final print version of a manuscript is restricted to subscribers, but immediate access is provided by author self-archiving or, increasingly, institutional archives More than 500 universities now provide institutional repositories to support self-archiving The Budapest Open Access Initiative (OAI) sets a standard for archiving through metatags that tag critical information such as author, title, and date in a uniform manner This permits OAI-compliant archives to be "harvested" by a web search engine (Harnad et al 2008) Some journals have experimented with a "hybrid" model, whereby an author submitting to a "green" journal can pay a publication fee to afford immediate access to his or her work in its final form The rationale for an author taking this action follows

Advantages of OA When considering the advantages of OA journals, at least three groups are relevant authors, readers, and libraries First, from the authors' perspective, OA ensures the maximum exposure and impact of their research Because OA articles are freely available to anyone with web access, the potential audience is much greater Studies reported by Harnad et al (2008) show that, for articles published in traditional business and management journals, self-archiving (i e , OA) increased citations by 75%–90% In physics, the difference was 250% Lawrence (2001) analyzed 120,000 computer science articles published between 1989 and 1998 and found that 85% of the most highly cited articles were OA Thus, OA benefits authors by providing a larger audience, by increasing their impact, and by shortening the lag time between acceptance and publication In addition, OA offers more flexibility with regard to mode of data presentation (e g , color, video), language format, and interactivity (Weiner 2001)

Readers benefit from OA by having access to a broad and timely research literature, at no cost and with the convenience of surfing the web A driving philosophy of the OA movement is that much scientific research is publicly funded and therefore "belongs" to the public at large Although most average citizens may not want to read the scientific literature, it should nevertheless be available to them Baldwin and Pullinger (2000) surveyed researchers in the United Kingdom regarding desirable characteristics of e-journals and found the following rank ordering breadth of coverage, up-to-date, fast access, ease of use, and good archives Open access offers clear-cut advantages over traditional journals in delivering those benefits

Finally, librarians sensitive to cost and accessibility concerns are leading proponents of the OA model Subscription costs are just the beginning for university libraries They also have to cover the costs of storage, binding, shelving, handling, and providing access All these costs are increasing (McKay 2009) Montgomery and King (2002) conducted a comprehensive cost analysis of Drexel University's library holdings, using a "cost per use" metric to compare print-only and e-journals They concluded that "full-text database e-journals" cost approximately $1 00 per use, while current issues of print-only journals cost $8 50 per use and bound journals cost $30 00 per use The largest cost factor for bound journals was storage costs Clearly, cost considerations lead librarians to greatly favor the trend toward electronic publication in general

Disadvantages of OA The primary drawback to the OA publication model is that newer, "gold" OA journals have been perceived as less prestigious outlets for scholarly research Even worse, some OA journals have not adhered to a rigorous peer-review process, though that is a dwindling minority Economic forces are also at work, as commercial publishers have little interest in relinquishing their subscription revenue stream in the face of uncertainty about how those revenues will be replaced As Solomon (2002, p 6) notes, "Although the scientists and other scholars hold the ultimate trump card in determining who controls the serial publications system, the publishers are both far more motivated and far more savvy" Finally, sheer inertia and scholarly tradition act as barriers (Weiner 2001)

Overall assessment of OA The emergence of OA publication has several important consequences for the scholarly research community It moves the process to one that is more dynamic rather than static Research is reviewed, accepted, and disseminated seamlessly and continuously rather than four or six times a year Because of the focus on individual articles rather than issues or even journals, a truer gauge of the "value" of an article emerges as readers access it, cite it, and, in the case of some journals, comment on it online (Weller 2000) Similar to product ratings on Amazon com, readers might even be encouraged to "rate" articles for their value (Johnson 2001) In a very real sense, the research community takes back ownership of its product in a global, collaborative format Harnad (2002) envisions "an optimal and inevitable" system in which all journals are online, refereed, paper-free, and OA As he notes, such journals are not cost-free, peer review still needs to be managed, and editing is essential Publishers could capture a fair fee for those services through a publication fee, but authors would retain ownership of their scholarly work

Recommendation 7 Adopt the OA green path

The journals at the AMA should adopt the OA green path, which currently is the dominant model in the online journal domain Print journals are bottlenecks in an increasingly digital scholarship system Researchers typically use computer technology to gather or access data, analyze it, and prepare their findings for review Manuscripts are submitted electronically through Scholar One, and reviewers are assigned to each manuscript by e-mail Reviewers then access the manuscript through the website and submit their reviews there as well The editor communicates decisions by e-mail to the authors Some months later, a manuscript that has been accepted for publication is copyedited (electronically) and is converted to a "galley proof" (electronically) for author consideration, and finally is published online as fully realized electronic manuscript When permitted by the publishers, some authors post these published electronic manuscripts to their own websites, where they can be accessed freely by anyone who has Internet access Eventually, depending on the lag time between acceptance and publication, the print version of the article appears However, most researchers, especially younger scholars, access the official electronic version rather than the printed version of the paper

Following the lead of other journals in the marketing discipline (e g , *Journal of Consumer Research*) by posting the fully edited and laid out electronic version of the article as soon as possible after acceptance would greatly enhance the timeliness of disseminating marketing research findings to the scholarly community Articles would no longer be subjected to a possible publication "backlog " Articles would be "officially" published when they were in final proof format, and knowledge would flow continuously rather than in two- or three-month intervals

The Review Process

Despite the vagaries of the peer-review process, including lack of convergence, lack of effort, turf defending, and other forms of human error (Lynch 1998), there is currently no viable substitute for peer review for ensuring the professional integrity of published research

Recommendation 8 Implement a more collaborative review model

The hallmark of Web 2 0 is the collaboration that exists among a community of users Wikipedia relies on the collaboration of literally hundreds of thousands of contributors to provide authoritative information Netflix makes recommendations to its users on the basis of a collaborative filtering of millions of users' movie consumption Facebook groups champion everything from *American Idol* contestants to presidential candidates Marketing scholarship can benefit by adopting a more collaborative posture

Collaboration is not new to marketing scholarship The vast majority of published articles are coauthored, the singly authored article is becoming a rarity Furthermore, many groups of coauthors are not at the same institution, e-mail and the Internet have greatly facilitated long-distance collaboration Many journals aspire to a collaborative review process, whereby the insights from reviewers assist the authors in improving their manuscripts, resulting in a superior final product However, this aspiration is often not met, at least not in the eyes of authors who experience rejection at the hands of less-than-diplomatic reviewers Some authors even feel that their work has been "hijacked" by an overzealous reviewer or editor (Lynch 1998)

Currently, *Journal of Consumer Psychology*, under the leadership of editor C W Park, is implementing a more collaborative reviewing model For manuscripts that are not clear rejections (either desk rejects or rejections based on reviewers' assessments), the editor, before making a final decision on the disposition of the manuscript, sends the reviews to the authors The authors are given one week to prepare a succinct response to the reviews, indicating how they would handle the reviewers' concerns This also provides the authors with an opportunity to disagree with reviewers' suggestions or to clarify points of misunderstanding Then, with the reviewers' comments and authors' responses in hand, the editor makes his decision on the fate of the manuscript (either reject or revise and resubmit) Park (2010) reports a high degree of author satisfaction with this approach as well as a higher degree of his own confidence in his decisions Obviously, this collaborative approach is more labor-intensive for the editor and requires a bit more time, but the early returns seem to suggest that the benefits outweigh the costs

Conception and Production of Marketing Scholarship

Enhancing the Contribution of Academic Scholarship to Marketing Practice

Not all marketing scholarship has the goal of affecting marketing practice Some research is legitimately aimed at advancing theory at a rather basic level However, given the mission of *Journal of Marketing*, the premise adopted herein is that the typical researcher working in the marketing domain seeks to influence practitioners at some level Criticisms of the content and value of academic marketing research are well-known and continuing (e g , Reibstein, Day, and Wind 2009, as well as other articles in this issue), and I will not repeat them here

Recommendation 9 Implement collaborative research design

If a more collaborative approach to the peer-review process seems fruitful, the prospect arises of collaboration at other phases of the research process How many times has a reviewer read a manuscript and had this reaction? "This is a fascinating topic, but the research design is completely and fatally flawed " It would be of systemic value to the discipline to head off fatally flawed research designs *before* they are executed This can be accomplished via collaboration, using at least two possible mechanisms

A proprietary research design collaboration model would largely mirror the existing peer-review process Authors would submit a carefully prepared synopsis of their intended research The synopsis would include the problem statement, the conceptual framework/literature review, hypotheses, and a detailed research design Seasoned reviewers would be asked to assess the viability and validity of the research design and make suggestions for improvements Authors could then proceed (or not) with their research with more confidence It would be important that this "concept test" review not be viewed as a tentative publication decision, therefore, such a model would best be set up independent from any particular journal, with a separate review board and editor Participation on such a review board should be attractive to the scholars in the field who enjoy playing a mentoring role

A more public, "open-source" form of research design collaboration would mimic the crowdsourcing model that is gaining favor in applied settings such as new product design and promotional campaign planning (Howe 2008) Under this model, a website would be created on which authors would be able to post their synopses Anyone would be free to comment on the quality of the proposed research and post suggestions for improvement Both authors and commenters would have the option of maintaining their anonymity, and a mechanism would exist to permit authors and commenters to contact one another directly for deeper conversations and for the purpose of forging possible research alliances This could be especially helpful in serving a matching function for authors working in different countries who would otherwise be unaware of their shared interest This model has more of the true "Web 2 0" character than the proprietary model in that it is more open and the participants' contributions are not moderated by an editorial structure

To provide either of these collaborative research design models with some degree of authority and prestige, they need to be administered under the auspices of a respected professional association To this end, the AMA's new "AMAConnect" site has much of the functionality required to accomplish this Here, marketing academics could create and manage profiles or groups that are public or private, all-inclusive or invite-only, and broad in scope or segmented by interest Public groups can interact and network with one another, which could bring a practitioner audience into conversation with academics, and private groups could engage in a more private conversation and share more potentially sensitive material (e g , data, research ideas) Within these groups, blogging, discussion forums, wikis, the ability to create and maintain a repository of files, and many other 2 0-related functionalities are all possible (see www marketingpower com/Community)

Recommendation 10 Implement collaborative problem definition

Logically preceding the research design decision is the selection of a topic to study Perhaps an even more common reviewer/editor reaction to a manuscript is, "What a shame all this careful work went into such an unimportant and/or ill-defined problem " For an extensive treatment of this issue, see Armstrong (2003) Collaborative problem definition could be of tremendous value to the field in channeling research efforts away from trivial problems and toward those that can make a more substantial contribution to knowledge

Currently, MSI publishes biannual research priorities that emanate from discussions among leading academic researchers and marketing practitioners at focused conferences hosted by MSI Similarly, the Institute for the Study of Business Markets provides grants and supplies data to researchers working in the business-to-business arena These approaches are useful but are, of necessity, not as comprehensive as the range of potential projects in the discipline And although the guidelines are generated collaboratively among a relatively small number of interested parties, a more open collaborative process would permit much broader participation, especially by emerging scholars who are less likely to be involved in the MSI process As with the research design collaboration I have discussed, two general models for problem definition collaboration exist

Under the proprietary model, prospective authors would submit their problem definitions for review by experts in the field. The submissions would be in the form of two- to three-page prospectuses, stating the problem clearly, supporting its potential value through selected literature, and, importantly, specifying the intended target audience (e.g., academics working in the same area, public policy makers, marketing practitioners). Given my emphasis in this article on research that influences practice, I would suggest that the practitioner category should be segmented further. For example, contributions might be intended primarily for chief marketing officers, brand managers, sales managers, or market researchers. Note that the target audience designation places some responsibility on the researchers to familiarize themselves with the concerns of people who hold those types of positions. Is it asking too much of professional researchers and dedicated scholars to interact with those whom they are trying to influence? Promoting one's research is not fundamentally different from promoting a product. The process works immensely better when it is grounded in a deep understanding of the market, such that the "product" generated truly meets the needs of the market and can be promoted as such.

The review board for this collaborative problem definition model would comprise representatives from all the various possible audience groups. Prospectuses would be sent to members of the identified target audience for commentary. The basic question to be addressed would be, Assuming that a research study successfully addressed the problem identified herein, how important would the findings be? Suggestions would be solicited for revising or refining the problem definition. Assuming a prospectus "passed" this test to the authors' satisfaction, they could then turn to research design with greater confidence and enthusiasm, knowing that someone else cares about their topic. If they chose, they could then avail themselves of the opportunity to submit their research design to the collaborative research design process.

Under a more collaborative problem definition approach, an open-source, crowdsourcing model again applies. Researchers would post prospective problem definitions to an AMA-sponsored website, and interested parties could comment. Because the website would be open to anyone, it would be useful to have a mechanism whereby those commenting could indicate their job title or role. Thus, for example, a senior scholar who has engaged in considerable C-level consulting might comment on a project aimed at chief marketing officers and indicate that he or she has sufficient C-level experience to make a reasoned assessment of the importance of the problem (e.g., Reibstein, Day, and Wind 2009). Note that people could also post research problems they would like to be solved (similar to the MSI Research Priorities, but in a more "dynamic" forum). As discussed previously for the open-source research design site, this mechanism would rely on a website sponsored by the AMA.

Intellectual property issues. An obvious concern that many may have with the open-source models is that participants are essentially placing their ideas in the public domain without complete protection. For those concerned about this issue, the proprietary forms of the process would make more sense than the open-source forms. And, of course, it is the individual researcher's choice to avail him- or herself of these new review processes at all. Researchers confident in their problem definitions and research designs can proceed as they always have.

Other scholars may embrace a more collaborative worldview and are not averse to putting their ideas in the public domain, either as a prospective author or as a commenter. For the open-source models I have described herein to work properly, "fair play" would have to govern the use of the websites. For example, it would be unfair of a commenter to literally "steal" someone's problem definition. Similarly, it would be unfair for an author to flood the site with scores of problem definitions to "stake a claim" to more ideas than he or she can possibly execute. Perhaps this is too utopian to expect, or even to wish for, but it is in this spirit that people submit their ideas for products and advertisements in open-source venues.

Incentive issues. One might raise the legitimate concern about the incentive an individual scholar would have for participating in such a collaborative process. Why would someone volunteer his or her time, effort, and creativity when no direct reward is entailed? First, it is worth noting that our current review process extracts enormous amounts of volunteer labor from the very best people in the discipline. Presumably, they donate their time freely and generously due to their commitment to scholarship and the intrinsic satisfaction received from mentoring aspiring scholars. As Belk (2010, p. 279) notes, the review process depends a great deal on participants' willingness to share their ideas and energy. In the marketplace for ideas, this becomes yet another mechanism whereby a talented individual can gain some recognition. Examples abound in commercial settings. Lee (2010) reports that BleacherReport.com, a sports website, has more than 3600 unpaid writers and *Huffington Post* has more than 6000 bloggers who work pro bono (and an audience of more than 23 million monthly). Consider the two amateurs, Joe and David Herbert of Batesville, Ind., who won the Doritos "Crash the Super Bowl" advertising competition in 2009. Not only did their ad win the Doritos contest and thus a 30-second spot during the Super Bowl, it also was ranked as the Number 1 Super Bowl ad overall by the *USA Today* ad meter, garnering a $1 million prize. The Herberts are $1 million richer today because they dared to share their idea with no guarantee of compensation (TheIndyChannel.com 2009). Although the risk-to-reward ratio may not be as favorable for academic scholarship, open-source research collaboration may nevertheless represent an opportunity for young scholars to gain some recognition in the field for their ideas (Chui, Miller, and Roberts 2009, p. 5; Gabor 2009, p. 7).

Tenure and promotion issues. An obvious concern that arises with the collaborative model proposed here is how participation and publication would be viewed by tenure and promotion committees (as well as by colleagues, deans, and department heads). Theoretically, contribution to knowledge should be the overriding criterion. In practice, candidates are often evaluated on the quality of the journals in which they publish and perhaps on the number of citations their articles garner Presumably, participation in this collaborative system by an author would (1) enhance the probability of making an A-level contribution and (2) make the publication process a bit more transparent The current review process is touted as a "value-add" process that helps improve papers Open collaboration would simply reveal more of that "behind-the-scenes" value-add process If a researcher ultimately publishes a valuable article, presumably it should "count" the same regardless of the process it went through to get there At the same time, emerging researchers should determine the views of their departments, just as they currently do for other aspects of the tenure and promotion process

Conclusion

In this article, I have tried to provide a rationale for Marketing Scholarship 2 0, a more digital, collaborative approach to marketing knowledge production and dissemination We often lament that academic research in marketing tends to follow rather than lead marketing practice In this instance, industry is leading the way in collaborative approaches to conducting business Leading business consulting firms (e g , McKinsey, Booz & Co) recently have published white papers on collaborative models, and it is clear that Web 2 0 is a game-changer for industry Scholarship in marketing needs to embrace the same philosophy

I have attended or appeared as a panelist at dozens of "Meet the Editors" sessions at conferences and doctoral consortia over the past three decades At virtually every one of these sessions, aspiring authors were admonished to focus on generating useful contributions to knowledge and not just on the journal review and publication process This is sound advice Yet, institutionally, the marketing discipline is not organized to support that advice with the necessary infrastructure The journal review process deals with completed research only Enhancing scholarly contribution of our collective research effort requires us to devise mechanisms such as the collaborative problem definition and research design processes outlined here This will enable marketing scholarship to migrate into the twenty-first century as Marketing Scholarship 2 0

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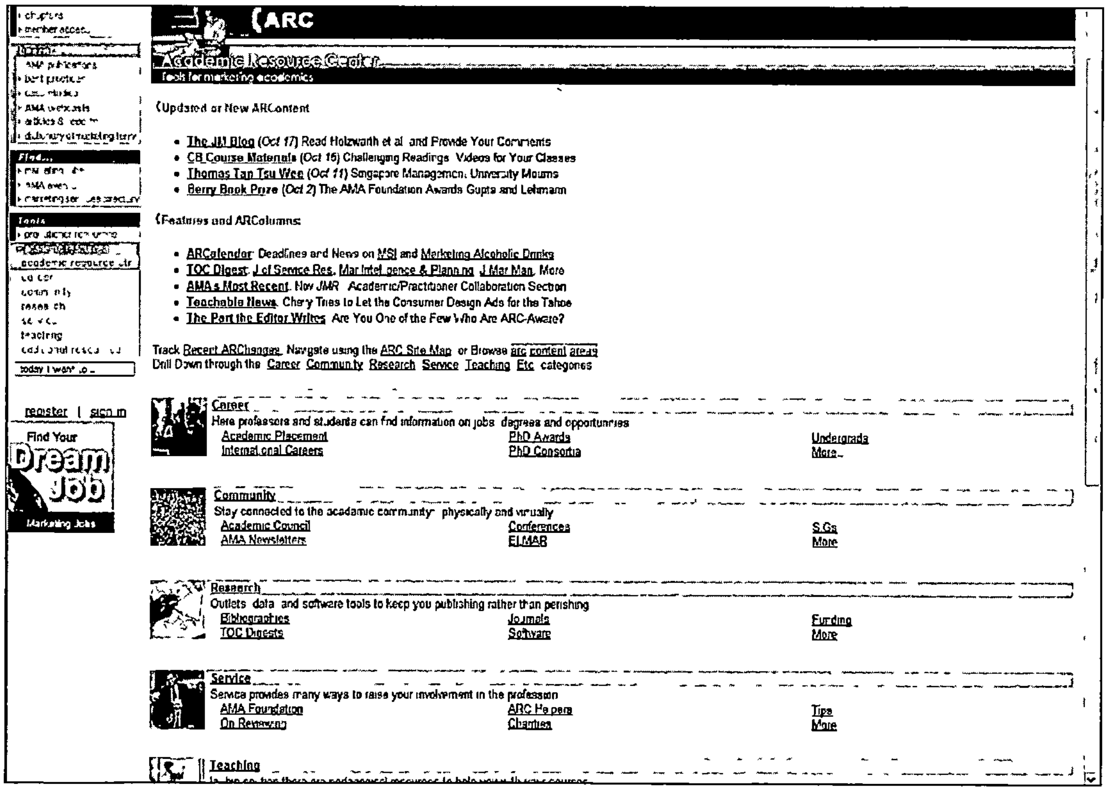

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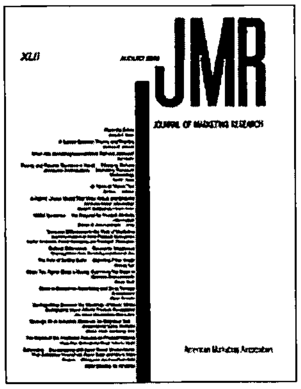

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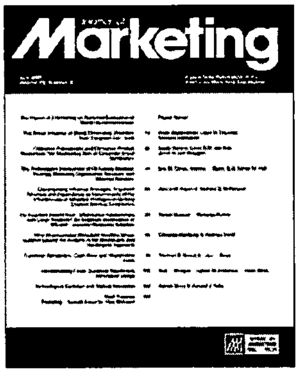

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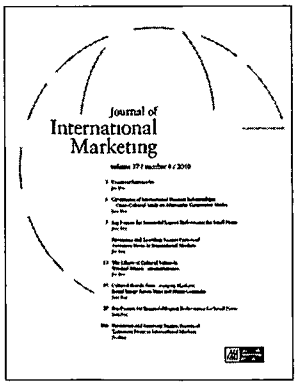

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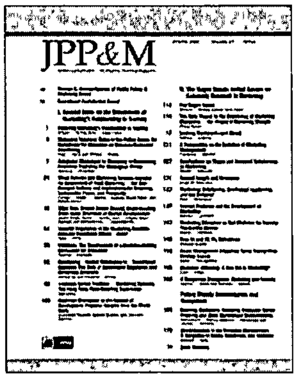

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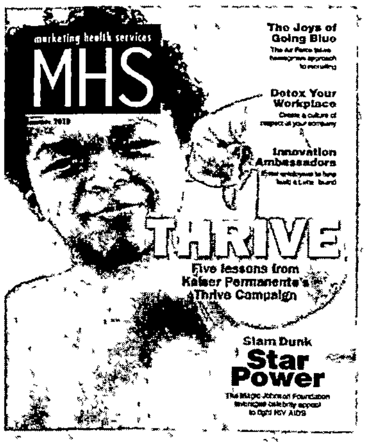

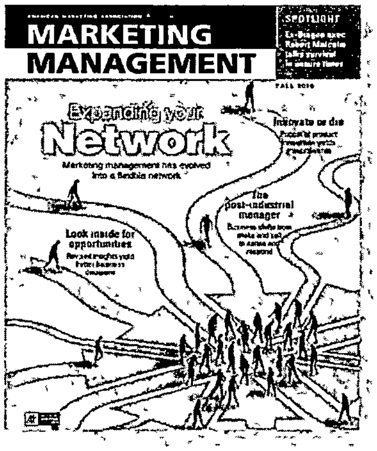

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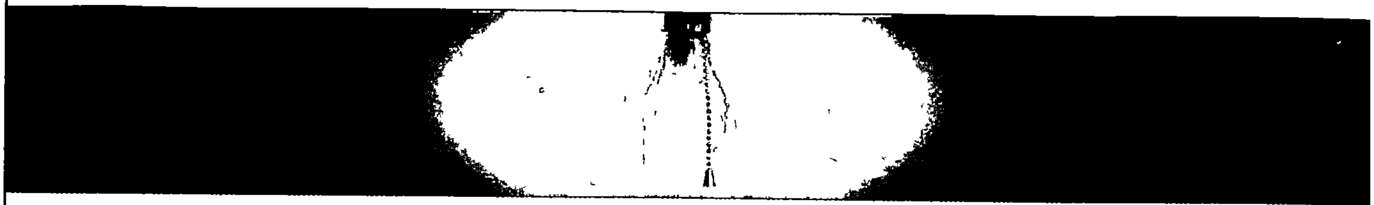

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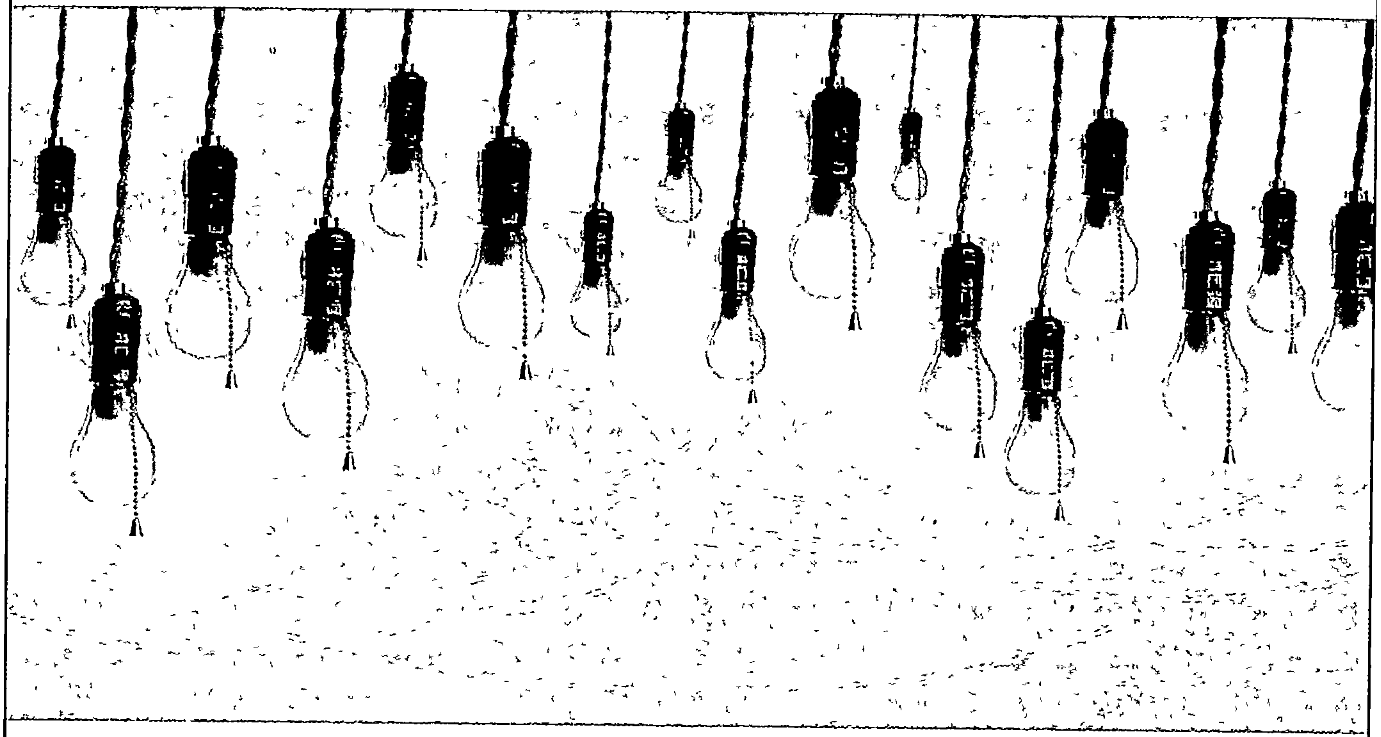

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Will Consumers Be Willing to Pay More When Your Competitors Adopt Your Technology? The Impacts of the Supporting-Firm Base in Markets with Network Effects

Network effects and standards competition introduce significant market uncertainty, creating a substantial challenge to the success of innovating firms Although the literature has highlighted the importance of establishing a large installed-user base (the number of users adopting the same product) in such markets, the authors draw attention to a different, but potentially important, market force the supporting-firm base, which they define as the number of firms supporting the same technological standard They test their proposed hypotheses using data from two markets the floppy disk drive and personal digital assistant markets Their results show that (1) consumer product valuation is positively affected not only by the installed-user base but also by the supporting-firm base, (2) the two positive effects interact with each other and the nature of the interaction changes over the evolution of the market (i e , they strengthen each other's impact in the early stage but weaken each other's impact in the late stage of the product life cycle), and (3) not all supporting firms are equally valuable to the innovator—specifically, consumers are affected more by firms exclusively supporting a single standard than by firms supporting multiple standards and by incumbents than by new entrants

Keywords network effects, installed base, supporting-firm base, standards competition, new product development

Network effects are becoming increasingly important in many marketplaces as information and digital technologies have significantly revolutionized the economy (Shapiro and Varian 1998) Some examples of industries affected by network effects include personal computers, software, video games and audio/video players, home networking, and many types of online services (e g , auctions, gaming, dating, music, social networking) These markets exhibit positive network effects because the value of a product/service to consumers increases with the number of users who have adopted it (Katz and Shapiro 1985, 1994) This unique characteristic of consumer interdependence imposes significant challenges for marketers because consumers in such markets are often reluctant to make adoption decisions because of a considerably high level of adoption uncertainty In the presence of network effects, the value of a product to an early adopter depends on the size of the future user base (Katz and Shapiro 1985), implying that, when making a purchase decision, a consumer must consider not only his or her own preference but also the preferences of other (future) consumers This is a difficult task for consumers because it is impossible to accurately predict whether the underlying new technology will eventually gain market acceptance Furthermore, markets with network effects are likely to experience fierce standards wars (e g , Betamax and VHS in the home VCR market, the Blu-ray and HD-DVD formats in the high-definition DVD player market, Apple's iPhone, RIM's Blackberry, Motorola's Droid, and Palm's Pre in the smartphone market) Brutal standards battles can lead to a "winner-take-all" market outcome (Shapiro and Varian 1998), which implies that, compared with traditional markets, it is more risky for consumers to purchase a new product because its cost can be exorbitant if the technology they purchase or adopt is the loser in a standards war

Facing such a high level of adoption uncertainty, consumers tend to delay their purchase and "wait and see" (Farrell and Saloner 1986), a tendency that imposes high start-up risks for innovators To enhance the innovation success in such markets, scholars and marketers have devoted increasing attention to the "installed-user-base effect" (i e , the impact of the number of current adopters on consumers' product valuation) For example, researchers have launched numerous empirical studies to investigate the installed-user-base effect in different industries, such as HDTVs (Gupta,

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Jain, and Sawhney 1999), VCRs (Ohashi 2003), video games (Shankar and Bayus 2003), CD players (Basu, Mazumdar, and Raj 2003), and personal digital assistants (PDAs, Nair, Chintagunta, and Dube 2004) Collectively, these studies provide strong evidence for a positive effect of the demand-side support Consumers are willing to pay more for products with a larger installed-user base The existence of installed-user-base effects has motivated marketing scholars and practitioners to investigate and apply various marketing strategies that facilitate the development of installed-user base in the presence of network effects, such as product preannouncement (Bayus, Jain, and Rao 2001), dynamic pricing (Xie and Sirbu 1995), free licensing and product line extension (Sun, Xie, and Cao 2004), and comparative advertising (Chakravarti and Xie 2006)

Different from the existing empirical studies of network effects, which have largely focused on demand-side support (i e , the installed-user-base effect), this study brings attention to a less explored force that may also significantly affect consumers' product valuation the supply-side support Specifically, we define the "supporting-firm base" as the number of manufacturers supporting the same underlying technology (i e , they produce hardware products based on an innovator's technology) For example, in the VCR market, the supporting-firm base for the Betamax standard includes all manufacturers that produced VCRs based on Sony's Betamax standard[1]

We focus our attention on the impact of the supporting-firm base on consumers' product valuation, and our empirical study is designed to answer the following questions First, will consumers be willing to pay more for a product with a larger supporting-firm base? A large number of supporting firms implies that more firms will manufacture and sell the underlying product Intuitively, we would expect that increasing the number of supporting firms could increase the sales of products that are based on the innovator's technology The greater the number of firms that produce the product, the higher is the product availability and the lower is the price However, it is not clear whether consumers would actually be willing to pay a higher price as more firms join in the innovator's camp The ability to increase the value of a product to consumers and to stimulate demand for innovation is important to the success of any innovating firm and is particularly crucial to firms facing network effects and standards competition Thus, answers to our first question are of significance to both research and practitioners

Second, if, as we argue here, consumers are positively affected by both the installed-user base and the supporting-firm base, how do the two driving forces interact (e g , strengthen or weaken each other's effect)? Does the nature of this interaction change across the product life cycle? Understanding the interaction between the installed-user-base effect and the supporting-firm-base effect as well as the dynamic pattern of this interaction will allow the innovator to allocate resources between the forces (i e , gaining support from demand side and supply side) optimally and dynamically

Third, are all supporting firms equally influential to consumers? If not, what types of firms have the strongest positive impact on consumers? Understanding which types of supporting firms (e g , incumbents vs newcomers) have the strongest impact on consumers will enable the innovator to target the most influential supporters and develop a high-impact supporting-firm base

We answer the proposed questions by first developing a set of hypotheses regarding the impact of supporting-firm base on consumers' product valuation and factors moderating this effect Following previous literature (Zeithaml 1988), we refer to consumer product valuation as the perceived value of a product to consumers, which is "the consumer's overall assessment of the utility of a product based on perceptions of what is received (e g , quality, volume, convenience) and what is given (e g , price, time, efforts)" (Zeithaml 1988, p 14) We test our theory by empirically investigating two markets the 3 5-inch floppy disk drive (FDD) and PDA markets The literature has classified both as markets with network effects (Gupta, Jain, and Sawhney 1999, Nair, Chintagunta, and Dube 2004, Srinivasan, Lilien, and Rangaswamy 2004, Wang, Chen, and Xie 2010), and both experienced intense standards competition

Our results support the proposed hypotheses and provide several important findings First, our empirical analysis of both markets demonstrates a direct positive influence of the supporting-firm base on consumers' product valuation, suggesting that consumers would actually be willing to pay a higher price as more firms join in the innovator's camp[2] To our knowledge, this is the first empirical evidence of a direct positive impact of supply-side support on consumers This finding calls for more attention from scholars and marketers to supply-side issues to stimulate demand and overcome the start-up problems in markets with network effects

Second, we find that the two driving forces in markets with network effects, the installed-user-base effect and the supporting-firm-base effect, strengthen each other's effects (i e , they have a complementary relationship) when a new technology is first introduced but weaken each other's effects (i e , they have a substitutive relationship) as the market evolves The existence of such a contingent interaction effect can be expected to motivate innovating firms to design their demand-side and supply-side strategies jointly and dynamically over the product life cycle

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[1] Note that our research focuses on supply-side support from manufacturers in the same industry Our definition of the supporting-firm base does not include the number of makers of compatible complementary products (e g , software producers for personal computers) It differs from the value net discussed in Srinivasan, Lilien, and Rangaswamy (2006), in which the value net refers to the suppliers and producers of complementary products that deliver utility either directly or indirectly to the customer

[2] Recent marketing literature has illustrated how consumer willingness to pay can be derived using the estimates of consumer utility function (product valuation) based on a choice model (e g , Jedidi and Jagpal 2009, Jedidi and Zhang 2002) Following this literature, we first propose and test the impacts of supporting-firm base on consumer product valuation and then address the impact of the supporting-firm base on consumers' willingness to pay (for a detailed discussion, see the "Discussion and Conclusion" section)

Finally, our results from the two markets reveal that consumers are affected not only by the size of the supporting-firm base but also by who the supporting firms are Specifically, firms that exclusively support a new technology influence consumers more than those supporting multiple standards, and incumbents exert more influence than newcomers on consumer product valuation These findings offer managerial guidance to innovating firms on how to effectively build the most impactful supply-side support

This study contributes to both the literature on network effects and the literature on strategic alliance To our knowledge, this is the first study in the literature of network effects to formally define the concept of the supporting-firm base and provide theoretical and empirical evidence supporting (1) a positive impact of the supporting-firm base on consumers' product valuation and (2) the contingent interaction between the installed-user base and the supporting-firm base Such new evidence has the potential to stimulate more theoretical and empirical questions regarding the supporting-firm-base effect, an important but less-understood market force in markets with network effects This study also contributes to the literature on strategic alliance, which, in contrast, has shown various benefits of strategic alliance, such as increasing firms' financial values and facilitating market expansions, to partnering firms (e g , Oxley, Sampson, and Silverman 2009, Swaminathan and Moorman 2009) Our research proposes and illustrates a new function of manufacturers' coalition in markets with network effects directly increasing the value of an innovation to consumers

This study offers some useful guidance to marketers First, our findings underscore the idea that to successfully establish demand for an innovation, marketers need to pay close attention to supply-side issues This insight is especially important given that, traditionally, marketing activities are more centered on demand-side issues Second, our results illustrate the benefit of designing the demand-side and supply-side strategies jointly and dynamically We also offer some specific suggestions for innovating firms in markets with standards competition (e g , aggressively pursuing support from both demand and supply side at the early stage but focusing on only one, not both, in the late stages of the product life cycle) Finally, our findings identify three specific dimensions that are critical for the innovator wanting to build an impactful supporting-firm base (1) size—pursuing support from a large number of manufacturers, (2) loyalty degree—building a supporting-firm base with a high percentage of single-standard supporters, and (3) incumbency level—securing strong support from industry incumbents, even if this would be more costly than simply targeting the newcomers

We organize the rest of this article as follows We first discuss the theoretical background and then develop our hypotheses We then introduce our model and present our empirical analyses Finally, we discuss contributions, managerial implications, and opportunities for further research

Theoretical Background and Hypotheses Development

Effects of the Supporting-Firm Base on Consumers

We propose that firms adopting an innovator's technology contribute more than simply selling products compatible with its technology (i e , helping achieve the current market share of its platform) A large number of supporting firms can directly enhance potential consumers' willingness to pay for the technology because a large number of supporting firms to a new technology can create three aspects of value to consumers (1) information value, (2) commitment value, and (3) competition value, each of which reduces consumers' uncertainty about the future success of the underlying technology and thus enhances their perceived product value

First, the supporting-firm base for a new technology creates information value, which signals industry confidence in that technology and in turn increases consumers' product valuation Because of information asymmetry, firms may know more about the (dis)advantages of the underlying technology and its relative market position in winning the standards competition than consumers, whereas the latter may know more about their own preferences than the former If consumers believe that, in general, firms have more information about the relative advantages of competing technologies than they do, then strong support for a specific technology from manufacturers could signal supply-side confidence in the technology For example, in the technology strategy literature, Swann (1987, p 245) suggests that the existence of a good number of firms supporting a technology can serve as an informational externality regarding the status of this technology as a future industry standard Such a signal can be credible because it is not in firms' best interest to invest in the technology if there is little chance of surviving a standards war

Second, a large number of supporting firms for a new technology can create commitment value, which can increase the chance of the technology's survival and success in the standards competition As we mentioned previously, markets with network effects and standards competition impose significantly high uncertainty to consumers, which reduces their willingness to pay for a new technology (Chakravarti and Xie 2006) As a result, consumers tend to postpone purchases until such market uncertainty is resolved Furthermore, unlike traditional markets, in markets with network effects, consumers often are required to choose not only a brand but also a technological standard (e g , Betamax vs VHS for VCRs, DVD vs Divx for DVD players, Word vs WordPerfect for word processing software, Blu-ray vs HD-DVD for high-definition DVD players)[3] It can be costly to consumers, however, if they select the losing standard The standards battle that occurred in the early 1980s in the VCR market is an illustrative example (Cusumano, Mylonadis, and Rosenbloom 1992) When Sony, the first mover, finally stopped manufacturing its Betamax machine as a result of the competition between it and the incompatible VHS player made by the later entrant, JVC, videotape manufacturers stopped making tapes for the Betamax machine, and Betamax VCR owners lost the value of their investment A recent example is the standards battle between DVD and Divx, two technologies that use spinning disks for storing and playing music, videos, and software The DVD was introduced in May 1997 Within a year, the incompatible Divx also entered the market, and 90,000 machines were sold in the first three months of national availability (Crothers 1999) A strongly contested standards battle ensued between the makers of DVD and Divx for market dominance In less than two years, DVD prevailed and Divx ceased production All Divx discs that were unsold at the end of the summer of 1999 were destroyed, and owners of Divx machines lost the value of their investment

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[3] Consistent with Srinivasan, Lilien and Rangaswamy (2006), we refer to the technological standard as the technical specifications for compatibility, adaptability, and connectivity that are required for the proper functioning of products

Over the past several decades, we have observed many unsuccessful technological standards, including CBS's Color Television, Sony's Betamax, Philip's digital compact cassette, Sony's Minidisk, and IBM's Token Ring for LAN standard While the cost to consumers who purchase a product that later loses a standards battle can be high, it is extremely difficult to predict the survival chances of the technology when making an adoption decision Such uncertainty can significantly reduce consumers' confidence and lower their product valuation However, consumers' confidence/product valuation can be boosted if they observe strong support for the technological standard from a large number of firms (Wade 1995) because winning a standards battle is more likely when more firms collectively make efforts to promote and develop the technological standard

Third, a large number of supporting firms also creates a price-competition effect, which increases the future installed-user base As we argued previously, one of the most important features in markets with network effects and standards competition is the future installed-user base In such markets, consumers are concerned not only with how many adopt a certain technology but also with how many will adopt it in the future, so that they can avoid being stranded in a lost technology Even if surviving a standards war is not a major concern (e g , in markets without competing standards or with the coexistence of multiple standards targeting different market segments), consumers still face a significantly high level of uncertainty because their adoption value depends on the size of the future user base of the product, which is difficult to predict For example, the value of a fax machine to early adopters depends on its future market acceptance level, the more fax machines that are sold, the more direct communication partners a fax machine owner can have Although the standards battle between the Blu-ray and HD-DVD formats in the high-definition DVD player market was recently settled by the exit of the HD-DVD format from the market, there is still significant uncertainty about future market acceptance of Blu-ray technology in face of incoming challengers (e g , Video on Demand, IPTV, and Internet downloading, which might leapfrog the high-definition standard, Greenstein 2008) Given the interdependence between product value to current buyers and the potential future market penetration level, consumers should incorporate their expectations of the future installed-user base of the new technology into their adoption decisions (Shapiro and Varian 1998) Clearly, it is difficult for individual consumers to predict the future market success of a specific new technology based on their own knowledge and information However, a large supporting-firm base may indicate greater future market potential because intense price competition will lead to a lower price and thus a higher potential total market adoption

Several theoretical studies in the economics and marketing literature have shown that, in the presence of network effects, the value of a product to consumers may be affected by the number of firms supporting the same technological standard because of their high expectation of its future network size For example, Katz and Shapiro (1985) prove that consumers are willing to pay a higher adoption price for a product in a competitive market than in a monopoly market because they expect that the future network will be larger (and thus they will gain a higher total adoption benefit) in a market with competing vendors than in one with a sole vendor Sun, Xie, and Cao (2004) extend such an analysis to product-line decisions Their analysis shows that the innovator may achieve a larger future network by free-licensing its technology to "clone" product makers than by extending its own line because the former leads to a competitive market whereas the latter leads to a monopoly market As a result, consumers form a higher product valuation for the innovator's product under a free-licensing strategy than under a product-line strategy Economides (1996) analyzes an oligopoly market and proves that a positive relationship exists between the number of imitators and the realized future network size

In summary, a large supporting-firm base implies both a higher level of industry support for the technology (i e , the supporting firms are allies) and a high level of price competition within the standard (i e , the supporting firms are rivals) From the perspective of allies, a larger supporting-firm base enhances the chance for the technology to win a standards battle From the perspective of rivals, a larger supporting-firm base intensifies price competition and leads to a larger future-user base Both suggest that, in the presence of network effects, consumers may value a product more when more firms support its technology Formally,

H_1 In the presence of network effects, consumer product valuation is positively related to the size of the supporting-firm base

Interaction of Supporting-Firm Base and Installed-User Base

The literature on network effects has empirically demonstrated that consumers' valuation of a new technology is positively affected by the size of the current installed-user base (e g , Basu, Mazumdar, and Raj 2003, Gupta, Jain, and Sawhney 1999, Nair, Chintagunta, and Dube 2004, Ohashi 2003) If the positive supporting-firm-base effect predicted in H_1 exists, consumers in markets with network effects are thus affected by two driving forces the installed-user base and the supporting-firm base To successfully introduce new products in such markets, firms must strategically manage these two forces and understand if and how they interact

Given the unique characteristics of markets with network effects and standards competition, we expect that the installed-user-base effect and the supporting-firms-base effect interact with each other and that the nature of this interaction is not fixed but rather changes as the market evolves Specifically, we propose a contingent view The interaction relationship is complementary when the product is first introduced but then becomes substitutive as the market evolves

A complementary relationship between the supporting-firm base and the installed-user base implies that they will strengthen each other's impact on consumers Notice that the installed-user base and the supporting-firm base reveal information from different perspectives (i e , the demand vs the supply side) Because of information asymmetry, consumers may know more about their own preferences, whereas firms may know more about the (dis)advantages of the underlying technology and its relative market position in winning the standards competition than consumers do In markets with network effects, success is not possible unless the technology gains support from both the demand and supply sides, because neither alone can create a large future network The failure of the HD-DVD is an example in which the technology failed to gain support from consumers even though it had strong support from industry (approximately 133 firms supported its standards, including Toshiba, Microsoft, Intel, HP, NEC, Studio Canal, and Universal, among others) The failure of Sony's Betamax is an example in which the technology failed to gain support from industry, though it had generated a dominant market share after four years on the market These examples suggest that the supporting-firm-base effect and the installed-user-base effect may be dependent on each other and may strengthen each other's impact

Such a complementary relationship between the installed-user base and the supporting-firm base is likely to occur at the early stage of new product introduction According to the accessibility–diagnosticity model (e g , Feldman and Lynch 1988), whether consumers will use a piece of accessible information for their decision making depends on the diagnosticity of the information When a new product is introduced, little information exists about the market reaction to the innovation from either the demand or the supply side The size of the initial installed-user base is more likely to reflect consumers' preferences independent of firms' preferences, and the size of the initial supporting-firm base is more likely to reflect the preferences of the supply side independent of consumers' preferences This suggests that both pieces of information have a high level of diagnosticity in the introductory stage of the product life cycle Moreover, support from one side is likely to have a stronger impact on consumers' confidence when there is also strong support from the other side (i e , they can enhance each other's diagnosticity), especially in the introductory stages, when consumers face overwhelming uncertainty and little other information is available This suggests a complementary relationship between the installed-user base and the supporting-firm base in the stage of product introduction

As the market evolves, the complementary relationship between the two market forces may become weaker as consumers become more confident about the signals they receive from either side (demand-side or supply-side support) Thus, they will value the product more when observing either a larger user base or a larger firm base, not necessarily both This implies that as the market grows, the installed-user-base effect and the supporting-firm-base effect become less complementary

Finally, as the market further develops, this relationship may become substitutive A substitutive relationship is possible because both the installed-user base and the supporting-firm base serve the same function reducing consumers' uncertainty about the future success of the technology A large current installed-user base increases potential buyers' expectation of a large future installed-base because it reduces their uncertainty about market acceptance of the technology In contrast, a large supporting-firm base also increases potential buyers' expectation for a large future installed-user base because it signals manufacturers' confidence in the technology and indicates a high likelihood of success for the technology in a standards war Because both the installed-user base and the supporting-firm base increase consumers' confidence about future success, they can have a substitutive relationship such that each will be more (less) influential when the other is small (large) Such a substitutability between the installed-user base and the supporting-firm base is more likely to arise in the later stage of the product life cycle because the firm-base may affect consumers' product adoption decision and the user base may affect firms' technology adoption decision Over time, the information revealed from one source will also reflect the information from the other source As a result, the two types of information become increasingly more substitutable Based on the preceding discussion, we formally hypothesize the following

> H_2 In the presence of network effects, there exists an interaction effect between the supporting-firm base and the installed-user base, and the nature of such interaction changes as the market evolves Specifically, (a) the two driving forces are complementary in the product introductory stage, such that each has a stronger impact on consumers' product valuation when the other is larger, (b) such a complementary relationship becomes weaker as the market evolves, and (c) the two driving forces are substitutive in the later stages of the product life cycle, such that each has a weaker impact on consumers' product valuation when the other is larger

Incumbents Versus New Entrants

Previously, we argued that a supporting-firm base can create both information value and commitment value, which increase consumers' valuation of a new technology Compared with new entrants in the supporting-firm base, we expect that incumbents create higher information and commitment values

First, when adopting a new technology, it is often more difficult for incumbents to make the adoption decision than for new entrants This is because incumbents often face higher risks in cannibalizing existing products and their employees often face more challenges in transferring technological know-how from the existing product to the new one (Mitchell 1989) Compared with firms new to the industry, incumbents need to be more confident about the potential of the technology (e g , there is a sufficient chance to offset lost sales from the existing product and attract new growth opportunity) before deciding to support the new standard This implies that support for the new technology from incumbents is a stronger and more credible indication of supply-side confidence than that from new entrants As a result, the former should have a greater impact on consumers' product valuation than the latter

Second, the literature on organizational behavior has shown that incumbents tend to outperform new entrants in their long-term market share, and the former have survival advantages due to the specialized assets that they possess relative to the latter (e g , Mitchell 1991) For example, when a new technology is introduced, specialized assets will be required in areas such as manufacturing, distribution, after-sales service, and complementary product development (Mitchell 1991) Consequently, incumbents can take advantage of their specialized assets to increase their potential for success when commercializing the new technology Incumbents' advantages in survival and performance imply that their support creates a higher commitment value than that of new entrants Formally,

> H_3 In the presence of network effects, consumer valuation of a product is positively related to the percentage of incumbents among the total number of its supporting firms

Single-Standard Supporters Versus Multiple-Standard Supporters

In markets with network effects, a new technology often faces intense competition from rival standards (e g , at the time of introduction, the Blu-ray DVD technology was facing competition from traditional DVD and HD-DVD technologies) The high uncertainty involved in standards competition may motivate an imitating firm to support multiple competing standards simultaneously to minimize its own risk Whereas investing in multiple standards provides supporting firms an opportunity to switch when the standards competition has been decided, investing in multiple standards conveys confusing signals to consumers about which technology may have a better chance to win a standards battle The imitating firms will support a single technology only if the firm is sufficiently confident about its potential success Thus, supporting multiple standards creates a lower information value to consumers than supporting a single standard

Furthermore, because single-standard supporters bear much higher risks than multiple-standard supporters, it is more credible that the former will fully devote their marketing efforts to promote the technology they support According to the signaling literature, the credibility of a signal depends on the commitment firms make and whether the commitment incurs irreversible costs (Heil and Robertson 1991) The irreversible and genuine investment made by single-standard supporting firms signals a more credible commitment to consumers, which in turn increases the commitment value to the consumer Therefore, the "loyalty level" of the supporting-firm base (i e , the percentage of firms exclusively supporting a new technology among all supporting firms) can serve as an indicator of overall confidence from the supply side regarding the new technology Accordingly, consumers may increase their product valuation when an increasing number of firms exclusively support the underlying technology Formally,

> H_4 In the presence of network effects and standards competition, consumer valuation for a product is positively related to the percentage of single-standard supporters among the total number of supporting firms

Model

The literature on network effects has tested the impact of an installed-user base on demand (consumer utility) using a choice model (e g , Nair, Chintagunta, and Dube 2004, Ohashi 2003) Discrete-choice models are a common, tractable, and parsimonious method for obtaining the desired structure on demand in econometrics (Berry 1994) Compared with the traditional regression model, a choice model for product demand allows the researcher to directly model consumer utility (i e , consumer product valuation) and can apply to both aggregate and individual demand data In this study, we adopt the same modeling approach but extend the demand model by incorporating other variables related to our core concept, the supporting-firm-base effect

Specifically, we test and compare two models

- Model 1 (the benchmark model) follows the literature to model consumer utility for a product as a function of the product attributes, price, and installed-user base

$$(1)\ u_{ijt} = \tilde{\beta}_0 + \sum_k X_{ijk}\tilde{\beta}_k - \tilde{\alpha} p_{jt} + \tilde{\gamma} UB_{t-1} + \xi_{jt} + \varepsilon_{ijt} = \bar{u}_{jt} + \varepsilon_{ijt}$$

- Model 2 (the proposed model) extends Model 1 by adding additional variables, including the supporting-firm base, the interaction terms between the installed-user base and the supporting-firm base, and the percentages of incumbents and single-standard supporters

$$\begin{aligned}(2)\ u_{ijt} = {} & \beta_0 + \sum_k X_{ijk}\beta_k - \alpha p_{jt} + \gamma UB_{t-1} + \theta_1 FB_{t-1} + \theta_2 FB_{t-1} \\ & \times UB_{t-1} + \theta_3 FB_{t-1} \times UB_{t-1} \times TIME + \theta_4 RINCMB_{t-1} \\ & + \theta_5 RSTECH_{t-1} + \xi_{jt} + \varepsilon_{ijt} = \bar{u}_{jt} + \varepsilon_{ijt}\end{aligned}$$

In both models, u_{ijt} is the utility of consumer i for product j at time t, X_{ijt} is the kth attribute for product j at time t, p_{jt} is price for product j at time t, and UB_{t-1} is the cumulative sales at time t – 1 (i e , a measurement of the consumer installed base) The term ξ_{jt} captures the unobserved characteristic for product j at time t, and ε_{ijt} captures the unobserved characteristic across product j and consumer i at time t, where ε_{ijt} is assumed to follow a double exponential distribution independent and identical across products and consumers (McFadden 1986). Model 2 has five additional variables: FB_{t-1} denotes the number of firms supporting the innovator's technology at time t – 1 (i.e., a measurement of the supporting-firm base), $FB_{t-1} \times UB_{t-1}$ and $FB_{t-1} \times UB_{t-1} \times TIME$ denote the interaction between the installed-user base and the supporting-firm base and the interaction over time, $RINCMB_{t-1}$ denotes the percentage of incumbent firms in the supporting-firm base, and $RSTECH_{t-1}$ denotes the percentage of firms supporting only the innovator's technology standard in the supporting-firm base.

We allow consumers to have the option of purchasing an outside product j = 0 (e.g., an option of no purchase) and normalize the utility of the outside products to 0 across time. Following McFadden (1974), the market share for product j at time t is given by

$$(3)\quad s_{jt} = \frac{\exp(\bar{u}_{jt})}{1+\sum_{j}\exp(\bar{u}_{jt})},\ j \neq 0, \text{ and } s_{0t} = \frac{1}{1+\sum_{j}\exp(\bar{u}_{jt})},\ j = 0,$$

where s_{jt} and s_{0t} denote the market share of product j and outside product j = 0. According to the market share equations mentioned previously, we can derive the demand equation for estimation as

$$(4)\qquad \ln(s_{jt}/s_{0t}) = \bar{u}_{jt}.$$

In the following section, we first estimate Equation 4 using data from the 3.5-inch FDD market. With the estimated Equation 4, we can write the estimated utility function (Equation 2) and test hypothesis H_1–H_4. Then, we validate our key findings using data from the PDA market.

Empirical Analysis

The 3.5-Inch FDD Market

"A floppy disk is a data storage device that comprises a circular piece of thin, flexible magnetic medium encased in a square or rectangular plastic wallet" (Wikipedia 2011). In the 1980s and 1990s, floppy disks were ubiquitously used to distribute software, transfer data between computers, and create small backups. With the increasing popularity of personal computers in the 1980s, small size and ease of carrying and displaying were becoming the major concerns of computer manufacturers and, thus, of disk drive manufacturers. Before Sony's introduction of the 3.5-inch FDD in 1981, there were two main FDDs: (1) 8-inch disk drives, which were introduced in 1967 by IBM and were mainly used in mainframe computers and minicomputers, and (2) the 5.25-inch disk drives, which were introduced by Shugart in 1976 and were mainly used in mini- and microcomputers.

Sony used a single-crystal ferrite head in its 3.5-inch FDD instead of the polycrystal ferrite head used in the 8-inch and 5.25-inch disk drives. The single-crystal ferrite head is lighter, more stable, and more reliable than the polycrystal ferrite head. With this stable and reliable read/write head, Sony was able to put the same number of tracks a 5.25-inch disk (80) could contain on a much smaller 3.5-inch disk and still maintain equal or even greater reliability than with the 5.25-inch and 8-inch disk drives (see Valigra 1981). As a result, disk density increased from 48 to 135 tracks per inch, while disk size greatly decreased.

Along with the introduction of Sony's 3.5-inch disk drive, many other micro–floppy disks contended for the micro-FDD market standard, two of which—the 3-inch and 3.25-inch drives—were major competitors to the 3.5-inch FDD. In addition, IBM, as a FDD industry incumbent, was also expected to introduce a 4-inch disk drive on an unknown schedule. These FDDs with different sizes were incompatible because disks could only be loaded into the appropriately sized drive. With these different sizes of FDDs competing in the market, there was considerable confusion as to which size the FDD industry would eventually adopt.

To build its technology as the industry standard, as reported in *Mini Micro System* (Valigra 1981) and *Disk Trend Report* (Porter 1983), Sony was willing to license its technology to U.S. manufacturers. On January 11, 1983, the *New York Times* also reported that "the Sony Corporation announced in Tokyo that it and 12 other manufacturers of the FDD in Japan and the United States had agreement to support a mutually compatible format for 3.5 inch floppy disks they market or will market in the near future." As a result, as many as 27 other manufacturers adopted Sony's technology and produced 3.5-inch FDDs in the same market. Five years later, Sony's 3.5-inch disk drive eventually became the industry standard (for annual sales of 3.5-inch, 5.25-inch, and other competing micro-FDDs [2-inch, 2.5-inch, 3-inch, and 3.25-inch], see Figure 1).

Data. We collected data from the 3.5-inch FDD markets to examine the proposed supporting-firm-base effects. The FDD industry was subject to strong network effects because different types of drives in this market were not interchangeable (i.e., files could not be shared), and the value of a given type of disk drive depended on the number of people who adopted this drive. Data were collected from *Disk Trend Report*,[4] a leading annual market research publication in the disk drive industry. *Disk Trend Report* is considered a highly reliable and complete source for the disk drive industry data (Christensen, Suarez, and Utterback 1998; Lerner 1997).

We collected a total of 170 observations of 3.5-inch FDD firms from 1983 to 1998. Variables used in the benchmark model (Model 1) are price, installed-user base, and product attributes, such as disk density (Den), track-to-track time (TT), and a dummy variable, D_{Sony}. Additional variables that are relevant to our hypotheses and incorporated in the proposed model (Model 2) are supporting-firm base, the interaction between the installed-user base and the supporting-firm base, and the percentages of incumbents and single-standard supporters. We describe the variable measurements in the following subsections.

Installed-user base and supporting-firm base. Following the literature on network effects (e.g., Brynjolfsson and Kemerer 1996), we measured the installed-user base for the 3.5-inch FDD technology as the cumulative sales of 3.5-

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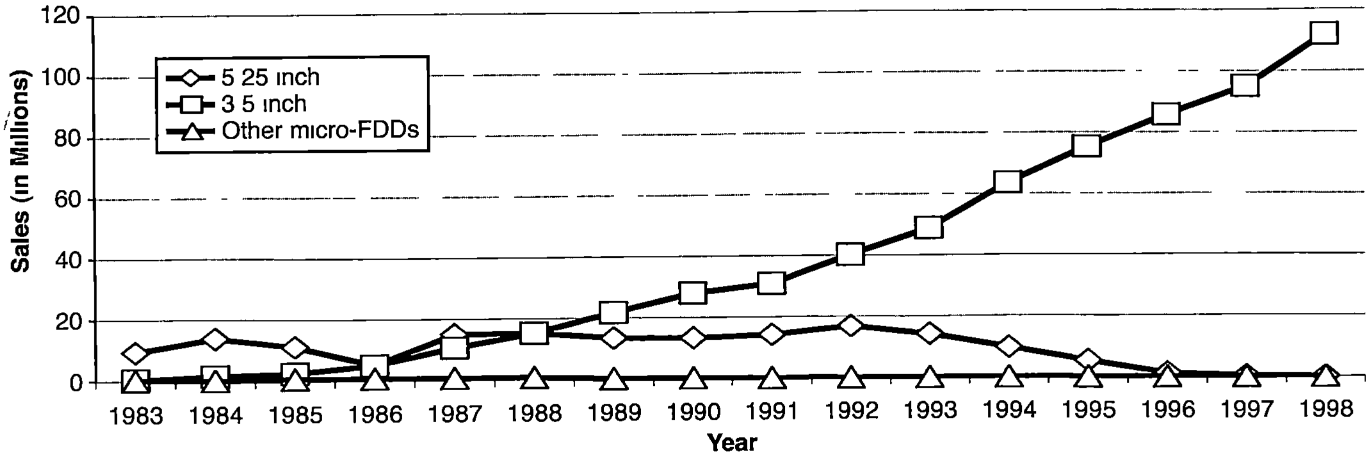
[4] We thank James Porter for his generous offer of the series of *Disk Trend Report*.

FIGURE 1
Annual Sales of 3.5-Inch and Other Competing FDD



inch FDDs in the previous time period. We measure the supporting-firm base for the 3.5-inch FDD technology using the total number of 3.5-inch FDD firms in the previous period. The number of firms that produced 3.5-inch FDDs varies over time from a minimum of 5 firms to a maximum of 29 firms.

Percentage of incumbents. Following the literature, we defined a firm as incumbent if it also produced a product that belonged to the previous generation (e.g., Mitchell 1991; Mitchell and Singh 1993; Srinivasan, Lilien, and Rangaswamy 2004). In our data set, the supporting firms of 3.5-inch FDD manufacturers are the incumbents if they also produced 5.25-inch FDDs. We then measured the percentage of incumbents by the ratio of the number of incumbents to the total number of firms that supported 3.5-inch FDDs.

Percentage of single standard supporting firms. During the time period when the 3.5-inch FDD technology was introduced, there were competing standards from the previous generation, such as the 5.25-inch FDD, invented by Shugart Associates in 1976 (Srinivasan, Lilien, and Rangaswamy 2004), and from the same microfloppy generation such as 2-inch, 2.5-inch, 3-inch, and 3.25-inch FDDs (*Disk Trend Report* 1985). Thus, we measured the percentage of single-standard supporting firms (RSTECH) by the ratio of the number of firms supporting only the 3.5-inch FDD to the total number of supporting firms (that might support either only the 3.5-inch FDD or both the 3.5-inch FDD and other standards).

Other variables. We used the measurements provided in *Disk Trend Report* for product attribute variables. For example, disk density is measured as number of disk tracks per inch, and the track-to-track time is measured as milliseconds spent from one track to another. We used the average price of each FDD manufacturer's product in our estimation. The average price is derived as the revenue (in dollars) divided by sales volume. To capture the dynamics of the interaction effect between the demand- and the supply-side support, we used a variable TIME to measure the time interval since the 3.5-inch FDD was first introduced. We also incorporated a dummy variable, D_{Sony}, to capture the brand name effects associated with the 3.5-inch FDD innovator, Sony. The dependent variable in the estimation is $\ln(s_{jt}) - \ln(s_{0t})$—that is, the natural logarithm of market share for each manufacturer in the 3.5-inch FDD market, subtracting the logarithm of market share for outside options. We measured the market share of each product, including outside options, as the annual sales of each product divided by the FDD market size, where the FDD market size is measured as the total market sales of the whole FDD market, including 8-, 5.25-, 4-, 3.5-, 3.25-, 3-, and 2-inch, as well as high-density, FDDs, in each year from 1976 to 1998, subtracting the realized sales from the previous years.

To increase the interpretability of the parameter estimates, we mean-centered the continuous variables such as the installed-user base and the supporting-firm base (Srinivasan, Lilien, and Rangaswamy 2008). Table 1, Panel A, summarizes the descriptive statistics of these variables.

Result. We present our estimation results of the benchmark model and the proposed model (Model 1 vs. Model 2) in Table 2. To ease comparison, we first estimate the two models using the same (least-square) estimation method (see Columns 1 and 2 in Table 2). As we show in Table 2, Model 2 significantly improves the goodness of fit compared with Model 1 (log-likelihood ratio = 34.360, d.f. = 5, $p < .01$), suggesting that incorporating the impacts of the supporting-firm base significantly improves the goodness of model fit.

Although using the same estimation method allows us to explicitly compare the two models, we need to be aware of a potential endogeneity issue related to the estimation of Model 2. To address this potential issue and examine the robustness of our results, we further reestimate Model 2 using a two-stage estimation procedure, a widely used methodology in econometrics, to count for potential endogeneity (Heckman 1976; Singh and Zhu 2008). Specifically, in the first stage of estimation, we first estimate the supporting-firm-base equation (i.e., the number of supporting firms) as a function of exogenous demand and cost variables and then derive the correction term to correct the potential cor-

TABLE 1
Variable Definition and Descriptive Statistics

Variable	Definition	M	SD
A: The 3 5-Inch FDD Market (N = 170)			
Sales	Product sales of each firm (in millions of units)	2 647	3 841
Price	Average price for each 3 5-inch FDD model ($/1000 units)	47 654	27 064
Installed-user base	Installed-user base, measured as cumulative sales at the previous period (in millions of units)	146 856	57 593
Supporting-firm base	Supporting-firm base, measured as number of supporting firms for each size of disk drives at the previous period	19 553	5 143
RINCMB	Percentage of incumbent firms in the supporting-firm base for each size of disk drives at the previous period	946	133
RSTECH	Percentage of single-standard supporters in the supporting-firm base for each size of disk drives at the previous period	311	109
Density	The number of tracks per inch on each side of FDD	132 592	7 793
Track to track	The milliseconds spent from one track to another	3 625	1 342
D_{Sony}	1 if the firm is Sony, and 0 if otherwise	094	293
TIME	Time interval since 1983, the beginning year of our data	8 071	4 099
B: The PDA Market (N = 6187)			
Sales	Product sales of each firm (in millions of units)	001	007
Price	Average price for each PDA model	287 014	329 734
Installed-user base	Installed-user base, measured as cumulative sales in the previous period (in millions of units)	8 766	6 390
Supporting-firm base	Supporting-firm base, measured as number of supporting firms for each operating system in the previous period	11 372	5 848
RINCMB	Percentage of incumbent firms in the supporting-firm base for each operating system in the previous period	112	070
RSTECH	Percentage of single-standard supporters in the supporting-firm base for each operating system in the previous period	820	121
SFTW	The natural logarithm of the number of software available for each operating system at the previous period	7 332	226
Palm OS	1 if Palm operating system is used in the PDA model and 0 if otherwise	486	500
Wireless	1 if wireless connection is provided and 0 if otherwise	383	622
Bluetooth	1 if Bluetooth connection is provided and 0 if otherwise	294	455
RAM	Size of RAM provided in the PDA model (in megabytes)	40 232	31 455
CPS	Processor speed (in MHz), from 16 MHz to 206 MHz	218 885	161 751
Slot	Number of expansion slots available in the PDA model	1 101	595
Color	1 if the PDA model provides color display and 0 if otherwise	797	402
Battery	1 if the PDA model has built-in lithium battery and 0 if otherwise	893	309
Area	Surface area of the PDA model, measured as height of model × width of model (in square inches)	14 859	6 266
Weight	Weight of the PDA model (in ounces)	6 809	4 771
Seasonality	1 when it is in December and January of every year	163	369
Casio	1 if the firm is Casio and 0 if otherwise	030	171
Compaq	1 if the firm is Compaq and 0 if otherwise	053	224
Handspring	1 if the firm is Handspring and 0 if otherwise	071	258
HP	1 if the firm is HP and 0 if otherwise	227	419
Palm	1 if the firm is Palm and 0 if otherwise	204	403
Sony	1 if the firm is Sony and 0 if otherwise	165	371
TIME	Time interval since January 2003, the beginning month of our data	24 033	14 324

Notes The installed-user base (measured as cumulative sales) increases with time, but the supporting-firm base (measured as the existing number of supporting firms) follows an inverted U-shaped dynamic, first increasing and then decreasing as a result of market saturation and competition from the next-generation technology (e g , the high-definition disk drives) This difference suggests that their correlation is likely to be time varying—specifically, positive in the early stage when both increase with time but negative in the late stage when the user base still increases but the firm base decreases Our FDD data illustrate such a time-varying correlation pattern 378 (from the 1st to the 5th year), – 83 (from the 6th to the 11th year), and – 939 (from the 12th to the 16th year) Because our PDA data cover only a relatively short later stage of the product life cycle, the correlation between the installed-user base and the supporting-firm base is negative (– 941)

relation between the error terms in Equation 2 and in the supporting-firm-base equation In the second stage of estimation, we then incorporate the correction term in Equation 2 Appendix A reports the technical details for correcting endogeneity in the estimation of Model 2, and the third column of Table 2 presents the estimation results for Model 2 using the two-stage estimation procedure

Comparing the third and the second column in Table 2 (i e , estimation of Model 2 with vs without correcting endogeneity), we find that they have the same qualitative pattern of the parameter estimations, but the significance of the estimation is improved when endogeneity is corrected Therefore, our subsequent discussion of the results of Model 2 refers to the estimation results reported in the third column

TABLE 2
Estimation Results Using the 3.5-Inch FDD Data

Variable	Model 1 Without Supporting-Firm Base		Model 2 With Supporting-Firm Base Without Correcting Endogeneity		Model 2 With Supporting-Firm Base With Correcting Endogeneity	
Intercept (β_0)	–1 217***	(175)	–1 624***	(187)	–1 373***	(238)
Price (α)	– 020***	(003)	– 004	(004)	– 005	(004)
Installed-user base (γ)	004***	(0006)	028***	(007)	029***	(007)
Supporting-firm base (θ_1)			196***	(049)	238***	(054)
Firm base × User base (θ_2)			0007**	(0002)	0006***	(0002)
Firm base × User base × TIME (θ_3)			–7 82E-05***	(2 84E-05)	–8 55E-05***	(2 85E-05)
RINCMB (θ_4)			493	(1 131)	2 383*	(1 588)
RSTECH (θ_5)			2 178***	(901)	3 088***	(1 046)
Density (β_1)	5 580***	(981)	3 745***	(1 053)	3 216***	(1 093)
Track to track (β_2)	– 084	(268)	437*	(263)	390	(263)
D_{Sony} (β_3)	1 094***	(206)	1 102***	(190)	1 097***	(188)
Error correction	N A		N A		– 683	(405)
Log-likelihood	–179 990		–162 810		–161 295	
Model comparison	Model 1 vs Model 2 (without endogeneity corrected) χ^2 = 34 360*** (d f = 5) Model 1 vs Model 2 (with endogeneity corrected) χ^2 = 37 390*** (d f = 6)					

*$p < 1$
**$p < 05$
***$p < 01$
Notes Numbers in parentheses are the estimated standard error Sample size = 170 N A = not applicable The TIME variable is omitted from the Model 2 estimation because of the high multicollinearity between the installed-user base and TIME as both variables naturally increase over time

Now we discuss our key findings First, as we show in the third column in Table 2, for both Models 1 and 2, the coefficients of price are negative ($\tilde{\alpha} = -020, p < 01$, and $\alpha = -005, p > 1$), and the coefficients of user base are positive ($\tilde{\gamma} = 004, p < 01$, and $\gamma = 029, p < 01$) These results suggest that consumer valuation is negatively affected by price but positively affected by the size of the user base, consistent with the literature on network effects (e g , Brynjolfsson and Kemerer 1996)

Second, H_1 proposes a positive impact of supporting-firm base on consumer product valuation The estimation results of Model 2 (the third column of Table 2) show that the coefficient of firm base is significantly positive ($\theta_1 = 238, p < 01$), suggesting that consumer valuation increases with the number of firms supporting the 3 5-inch FDD standard Therefore, H_1 is empirically supported

Third, we propose a contingent interaction effect between the supporting-firm base and the installed-user base They are complementary when the product is first introduced (H_{2a}), such a complementary relationship becomes weaker with time (H_{2b}), and they are substitutive in the later stages of the product life cycle (H_{2c}) First, as we show in Table 2, the coefficient of interaction term, FB × UB, is significantly positive ($\theta_2 = 0006, p < 01$), which supports H_{2a} (i e , a complementary interaction when TIME = 0, the product is first introduced) Second, the coefficient of interaction term, FB × UB × TIME, is significantly negative ($\theta_3 = -8\ 55E\text{-}05, p < 01$, see the third column in Table 2), which supports H_{2b} Finally, we rewrite the sum of interaction terms as $\Gamma \times FB \times UB$, where $\Gamma = (\theta_2 + \theta_3 \times TIME)$ and represents the net interaction effect between the supporting-firm base and the installed-user base We calculate and test the significance of coefficient Γ (see Table 3) As Table 3 shows, the interaction effect between the supporting-firm base and the installed-user base is complementary in the early stages when the 3 5-inch FDD technology was introduced (supporting H_{2a}), then becomes less complementary (supporting H_{2b}), and eventually, turns into a substitutive

TABLE 3
Hypothesis Test for Interaction Effect (Using the 3.5-Inch FDD Data)

Year	Time Trend	Net Interaction Effect	
1983	0	00060***	(00021)
1984	1	00051***	(00020)
1985	2	00043***	(00019)
1986	3	00034**	(00019)
1987	4	00026*	(00019)
1988	5	00017	(00019)
1989	6	00008	(00020)
1990	7	–2 0E-06	(00021)
1991	8	–8 8E-05	(00022)
1992	9	– 00017	(00024)
1993	10	– 00026	(00026)
1994	11	– 00035	(00028)
1995	12	– 00043*	(00030)
1996	13	– 00052*	(00032)
1997	14	– 00060**	(00035)
1998	15	– 00069**	(00037)

*$p < 1$
**$p < 05$
***$p < 01$
Notes Numbers in parentheses are standard errors We rewrite the sum of interaction terms as $\Gamma \times FB \times UB$ to represent the net interaction effect between the supporting-firm base and installed-user base, where $\Gamma = (\theta_2 + \theta_3 \times TIME)$ Sample size = 170

relationship in the later stages (supporting H_{2c}) Thus, we find that empirical evidence supports all three predictions in H_2

Fourth, H_3 proposes a positive impact of the percentage of incumbents in the supporting-firm base As Table 2 shows, the coefficient of RINCMB is significantly positive ($\theta_4 = 2\,383, p < 1$), which supports H_3 Finally, H_4 proposes a positive impact of the percentage of single-standard supporting firms in the supporting-firm base As Table 2 shows, the coefficient of RSTECH is significantly positive ($\theta_5 = 3\,088, p < 01$), which supports H_4 These two results taken together suggest that (1) consumers are concerned not only about the size of the supporting-firm base but also about the nature and identity of the supporting firms and (2) supporting firms that are loyal to the innovator's technology and are incumbents contribute more to the supporting-firm-base effect than those that are stakeholders in multiple standards and those who are newcomers

Robustness and validity of results To examine the robustness and validity of our results, we performed three additional analyses First, we tested for autocorrelation and heteroskedasticity issues in the second stage estimation of Model 2 to ensure that our estimation is unbiased and efficient Our results suggest that (1) there is no significant autocorrelation in our data set (the Durbin-Watson statistic = 2 177) and (2) the null hypothesis of homoskedasticity cannot be rejected (Breusch-Pagan Lagrange multiplier statistic = 8 86, d f = 11, $p > 634$), in other words, there is no significant heteroskedasticity in our data set

Second, we also estimated Model 2 by correcting endogeneity and allowing consumer heterogeneous valuation in the installed-user base, supporting-firm base, and the interaction of the two driving forces Our results demonstrate that (1) the same conclusions based on parameter estimation still hold when consumer heterogeneity is controlled for and endogeneity is corrected and (2) there is no significant consumer heterogeneity in the installed-user base and supporting-firm base (see the results in Appendix B)

Third, to enhance the generality of our findings, we further extended the analysis to another market, the PDA Such an extension is especially important because this is a more recent market with strong network effects and ongoing standards competition (Nair, Chintagunta, and Dube 2004) The network effects arise in this industry as the value of a PDA increases with both the number of consumers who have adopted compatible PDAs and the variety of compatible software for those PDAs The PDA industry also exhibits extensive standards war among several incompatible operating systems since the first PDA was introduced in 1992 For example, during the earliest stage of PDA market development, at least six incompatible PDAs contended for the market standard from 1992 to 1995, such as Apple's Newton, Armstrad's PenPad, Tandy and Casio's Zoomer, Bell South's Simon, Sony's Magic Link, and Motorola's Envoy (Bayus, Jain, and Rao 1997) Since 1996, when the first Palm PDA was launched, until the present, the PDA industry has gradually become dominated by two incompatible operating systems (OSs) Palm OS and Microsoft Windows OS

We were able to collect monthly data from the PDA market from January 2003 to April 2007, a data set with 6187 observations covering a relatively late stage of the PDA industry (compared with the whole product life time from 1992 to present) Key variables such as installed-user base, supporting-firm base, percentage of incumbents, and single-standard supporters in the supporting-firm base incorporated in Model 2 are defined as those in the 3 5 FDD market In addition, the availability of software titles is incorporated to directly capture the indirect network effect in the PDA market (for variable definition and descriptive statistics, see Table 1, Panel B) We use a nested logit model to estimate the Model 2 by using PDA data and control possible correlations among products within each standard (for the nested-logit model in detail, see Berry 1994 Because our PDA data cover only a relative short later stage of the product life cycle, we expect that the nature of the interaction between the installed-user base and the supporting-firm base may not change significantly during our data coverage (i e , the coefficient of the term, FB × UB × TIME, may be insignificant) Thus, we report the estimation results with and without including the moderating effect of time—that is, FB × UB × TIME, in Table 4 (the latter enables us to directly test a possible substitutive interaction effect in the later stage)

As we expected, the term of FB × UB × TIME is insignificant when it is included in the model ($\theta_3 = 1\ 13E\text{-}05$, $p > 01$, see Estimation 2 in Table 4), which confirms that the interaction effect remains the same in the period covered by our data Therefore, in the next section, we mainly discuss the results in Estimation 1 in Table 4 First, we found a significantly positive coefficient for the supporting-firm base ($\theta_1 = 035, p < 01$), which supports H_1 Furthermore, we found the interaction between the installed-user base and the supporting-firm base is significantly negative ($\theta_2 = -019, p < 01$), suggesting a substitutive interaction effect in the later stage of the PDA market, which partially confirms H_2 Finally, we found that the coefficients of the percentages of incumbent firms and those that support a single standard are significantly positive ($\theta_4 = 497, p < 01$, and $\theta_5 = 2\,068, p < 01$) Overall, these results are consistent with our findings based on the 3 5-inch FDD data and provide additional support for our proposed theory

Discussion and Conclusion

This study investigates how the number of firms supporting the same technology may directly affect consumers in markets with network effects and standards competition Specifically, it conceptualizes and tests (1) the relationship between consumers' product valuation and the supporting-firm base, (2) the potential interactions between the installed-user base and the supporting-firm base, and (3) the types of firms that most influence consumers Our empirical results provide evidence to support our proposed theory

Research Contributions

First, whereas a long stream of literature on network effects has focused on the impact of an installed-user base, this study draws attention to an important but underexplored

TABLE 4
Estimation Results Using the PDA Data

Variable	Estimation 1		Estimation 2	
Intercept	–16 686**	(1 122)	–16 039**	(1 510)
Price	3 94E-06	(1 28E-05)	4 08E-06	(1 28E-05)
Installed-user base	183**	(008)	177**	(012)
Supporting-firm base	035**	(007)	033**	(007)
User base × firm base	– 019**	(001)	– 018**	(002)
User base × firm base × time			1 13E-05	(1 76E-05)
RINCMB	497**	(157)	469**	(163)
Single-standard supporter	2 068**	(159)	2 086**	(161)
Software availability	1 268**	(139)	1 180**	(196)
Palm OS	– 182*	(060)	– 108	(131)
Wireless	– 005	(007)	– 006	(007)
Bluetooth	008	(010)	008	(010)
RAM	–3 88E-07	(1 92E-04)	–2 45E-07	(1 92E-04)
Processor speed	1 81E-05	(4 43E-05)	1 83E-05	(4 43E-05)
Slot	– 001	(007)	– 001	(007)
Color	– 002	(012)	– 002	(012)
Battery	–2 93E-04	(014)	–4 36E-04	(014)
Area	– 001*	(5 91E-04)	– 001*	(5 91E-04)
Weight	5 10E-04	(8 15E-04)	5 04E-04	(8 15E-04)
Casio	–9 5E-04	(021)	– 001	(021)
Compaq	2 86E-04	(016)	8 98E-04	(017)
Handspring	– 009	(021)	– 009	(021)
HP	008	(011)	007	(011)
Palm	006	(018)	006	(018)
Sony	0007	(020)	001	(020)
Seasonality	407**	(009)	406**	(009)
σ	995**	(001)	995**	(001)
Adjusted R^2	991		991	

*p< 05
**p< 01
Notes Numbers in parentheses are standard errors Sample size = 6187

factor the supporting-firm base Our investigation takes a first step toward providing empirical evidence to show that, when facing network effects, the value of a product to consumers is not only affected by the number of current users, as suggested by the literature, but is also influenced by the number of the firms supporting the technology This finding elucidates the full value that a large supporting-firm base provides in such markets, that is, it not only helps to enlarge the market share of the technology by producing/selling compatible products but also directly affects consumers' product valuation

Second, our conceptual development and empirical investigation reveal that the impact of the supporting-firm base is multidimensional, such that consumer valuation is affected by three dimensions (1) its size, (2) its loyalty level (i e , the percentage of firms that support only one standard), and (3) its incumbency level (i e , the percentage of firms that were operating in the industry before the introduction of the new technology) These findings further advance theoretical understanding of the supporting-firm-base effect (i e , not only the size but also the composition of the supporting-firm base are important to consumers) Specifically, consumers value the support of loyal firms and incumbent firms more than nonloyal firms and newcomers These insights can help firms allocate their resources to build the most effective supporting-firm base

Third, we find empirical evidence to show that the interaction effect between the installed-user base and the supporting-firm base varies across the product life cycle The two driving forces strengthen each other's impact in the early stages when a new technology is introduced, but such a complementary relationship becomes weaker with time and eventually turns into a substitutive relationship in the later stage of the product life cycle This finding integrates the impact of market forces from both the demand and supply sides and provides a more complete understanding as to how the two important driving forces interactively affect consumers who face high market uncertainty

Finally, our study also contributes to the strategic alliance literature Whereas extant studies focus on how partner firms benefit from strategic alliances, we show that an innovating firm's ability to establish strategic alliances also benefits consumers in markets with network effects Furthermore, the interaction effects between the installed-user base and the supporting-firm base identified in this research adds to the literature on strategic alliance by demonstrating that the effectiveness of a strategic alliance can be influenced by factors on the demand side Specifically, we show that, in markets with network effects and standards competition, a large installed-user base can strengthen or weaken the impact of a strategic alliance (i e , the supporting-firm base) on future consumers depending on the stage of the product life cycle Our empirical findings also advance the literature by revealing the desirable "identity" of strategic alliances in networked markets firms supporting a single standard and those with incumbent status are more valuable partners

Managerial Implications

The new insights into the supporting-firm-base effect derived from this research offer useful guidance for managers To illustrate some specific managerial insights, using the estimated parameters (i e , $\hat{\gamma}$, $\hat{\theta}_1$, $\hat{\theta}_2$, $\hat{\theta}_3$) based on the 3 5-inch FDD data in Table 2, we calculated and tested the overall impacts of the installed-user base and the supporting-firm base on consumer product valuation using their observed values in our 3 5-inch FDD data Specifically, we estimated the overall installed-user-base and supporting-firm-base effects as $\Omega_{UB} = (\hat{\gamma} + \hat{\theta}_2 FB + \hat{\theta}_3 FB \times TIME)$ and $\Theta_{FB} = (\hat{\theta}_1 + \hat{\theta}_2 UB + \hat{\theta}_3 UB \times TIME)$, where the observed value of UB, FB, and TIME in each time period from 1983 to 1998 are used We present the estimates of the overall installed-user-base and supporting-firm-base effects in Table 5 Next, we discuss five main managerial implications for both innovating firms and followers

TABLE 5
Overall Effect of Installed-User Base and Supporting-Firm Base (Using 3.5-Inch FDD Data)

Year	Time Period	A: Overall Installed-User-Base Effect		B· Overall Supporting-Firm-Base Effect	
1983	0	021**	(006)	150**	(044)
1984	1	023**	(006)	163**	(045)
1985	2	032**	(008)	176**	(048)
1986	3	032**	(008)	189**	(050)
1987	4	028**	(007)	203**	(053)
1988	5	025**	(006)	216**	(055)
1989	6	023**	(005)	229**	(056)
1990	7	020**	(004)	238**	(057)
1991	8	018**	(004)	243**	(056)
1992	9	016**	(003)	243**	(055)
1993	10	014**	(003)	235**	(053)
1994	11	012**	(002)	218**	(052)
1995	12	011**	(002)	185**	(056)
1996	13	010**	(002)	133*	(070)
1997	14	009**	(001)	064	(096)
1998	15	009**	(01)	– 027	(133)

*p< 05
**p< 01
Notes Numbers in parentheses are the estimated standard errors We estimated the coefficient of the overall installed-user-base effect as $\Omega_{UB} = (\hat{\gamma} + \hat{\theta}_2 FB + \hat{\theta}_3 FB \times TIME)$ and the coefficient of the overall supporting-firm-base effect as $\Theta_{FB} = (\hat{\theta}_1 + \hat{\theta}_2 UB + \hat{\theta}_3 UB \times TIME)$

Understanding the full value of supporting firms An innovating firm should recognize that firms adopting its technology contribute more than simply selling products compatible with its technology (i e , enlarging the market share of its platform) Recent marketing literature suggests that consumer willingness to pay can be defined as "the price at which the value to a consumer is indifferent between buying and not buying a product" (Jedidi and Jagpal 2009, p 38) and that consumer willingness to pay can be derived using the estimates of consumer utility function based on a choice model (Jedidi and Jagpal 2009, Jedidi and Zhang 2002) This implies that consumers are willing to pay more for a product with a larger number of supporting firms [5] Thus, it is crucial for innovating firms to develop effective strategies to take advantage of this benefit in markets with extremely high survival risk and uncertainty

Designing the two strategic dimensions jointly and dynamically While both a large installed-user base and a large supporting-firm base are critical success factors, they are not independent market forces Rather, they strengthen each other's impact in the early stage of product introduction but weaken each other's impact later (as we show in Table 3, the interaction effect changes from positive to negative) To optimally allocate its resources, the innovator should design and implement the two strategies jointly and strategically rather than treating them as two separate strategic decisions Specifically, it is more efficient for the innovating firm to invest simultaneously in both the demand and supply sides in the product introductory stage (e g , directly stimulate demand by offering a low price *and* directly facilitate industry support by offering technological support to its "clones" or charging low licensing fees), even though doing both at this stage (i e , before receiving any revenue from the innovation) can be costly In this very early stage, ignoring either side not only overlooks an important success factor but also reduces the impact of the other However, it is more efficient to focus on only one market force, but not both, in the late stages of the product life cycle This is because, as the market evolves, the supports from both the demand and supply sides become substitutive (i e , they weaken each other's effect)

Increasing investment in the early stage The overall impact of the installed-user base and that of the supporting-firm base are neither constant across time nor always decreasing with time Rather, both follow an inverse U-shaped dynamic pattern (see Table 5), first increasing and

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[5] Using the estimated parameters based on the 3 5-inch FDD data in Table 2 and the definition of consumer willingness to pay (Jedidi and Jagpal 2009, Jedidi and Zhang 2002), we are able to derive the consumer willingness to pay function, which is the price level that is equal to or less than

$$\begin{aligned} WTP = \frac{1}{\hat{\alpha}}\Big(&\hat{\beta}_0 + \sum_k X_{ijk}\hat{\beta}_k + \hat{\gamma}UB_{t-1} + \hat{\theta}_1 FB_{t-1} + \hat{\theta}_2 FB_{t-1} \\ &\times UB_{t-1} + \hat{\theta}_3 FB_{t-1} \times UB_{t-1} \times TIME + \hat{\theta}_4 RINCMB_{t-1} \\ &+ \hat{\theta}_5 RSTECH_{t-1}\Big) \end{aligned}$$

then decreasing with time.[6] The increasing impact of the supporting-firm base effect in the early stage of product introduction (due to a complementary relationship between the installed-user-base effect and the supporting-firm-base effect) is particularly intriguing. It suggests that although building a growing supporting-firm base can be costly, it is not always optimal for the innovator to gradually reduce its investment in recruiting more firms to adopt its technology. Rather, in the early stage of product introduction, the innovator can benefit by increasing its investment in building its supporting-firm base over time even if it has successfully persuaded an increasing number of firms to joint its camp.

Targeting the most influential supporters. Not all supporting firms are equally valuable to the innovator. Thus, it is important for the innovator to strategically target the most influential supporters, such as those in operation before introduction of the new technology. Although it may be more costly to persuade incumbent firms than newcomers to support a new incompatible technology, consumers put more weight on the standard choices made by the former than those made by the latter. It is also important for the innovating firm to carefully evaluate the additional value single-standard supporters offer compared with that multiple-standards supporters offer from the consumer's perspective (as shown in our study) when deciding its strategic alliance policy.

Be aware of potential conflict. Firms need to be aware that the two success factors, building a large installed-user base and a large supporting-firm base, can lead to conflicting marketing implications. For example, price competition can have opposite effects on building the former and the latter. Aggressively competing on price attracts more consumers to new products but discourages firms from producing compatible products. Furthermore, although the innovator can strengthen the competitive advantage of its product relative to a clone product by limiting the quality/functionality of the clones through its technology and legal advantage/power, such a great quality differentiation can discourage imitators from entering the market and thus reduce the size of its supporting-firm base. The supporting-firm-base effect discussed here suggests that it may not always be in the innovator's best interest to use its technology or marketing power to maximize quality differentiation (e.g., by limiting the extent to which the imitating firms can use its more advanced technology), even if such differentiation can be achieved cost-free. Firms competing in markets with network effects and standards competition should take these potential conflicts into consideration when designing their marketing strategies.

Limitations and Further Research

Although our study is subject to several limitations, it raises some important and interesting issues that call for further academic and managerial attention. As a first step toward examining the impact of a supporting-firm base in markets with network effects, this study focuses only on the supporting-firm-base effect from the consumer's perspective. It is also important to examine the ways supporting-firm-base effect may affect firms' marketing strategies. For example, as we discussed previously, intense price competition may help the installed-user base but hurt the supporting-firm base in markets with network effects. It would be interesting to examine how firms should optimally design their pricing strategies when facing such conflicts. It is also important to investigate strategies that effectively facilitate the development of a large supporting-firm base, such as licensing fee structures (e.g., lump-sum vs. loyalty fee, dynamic fee structure) and effective ways to attract loyal alliances. Furthermore, this study illustrates the existence of supporting-firm-base effect using data from two different markets. It would be valuable to examine how the magnitude of the supporting-firm-base effect may be affected by (1) the network effect strength and (2) the direct/indirect network effects through analyzing data from more markets with network effects. Finally, because of a lack of individual-level consumer data, in this study, we examine the supporting-firm-base effects using aggregate data. A fruitful topic for further research is to design behavioral experiments to examine directly how consumers perceive the three possible underlying values (information, commitment and competition).

Appendix A
Two-Stage Estimation Procedure

We used a two-stage estimation procedure to account for the potential endogeneity of the supporting-firm base when we examine its effect on consumer product valuation. Specifically, we first estimate a supporting-firm-base equation and then derive the correction term that will be incorporated in the second-stage estimation of the supporting-firm-base effect. In the following, we first present the model for the supporting-firm-base equation and then the estimation results. Finally, we derive the correction term to incorporate in the second-stage estimation of Model 2.

Supporting-Firm-Base Equation

We adopt the entry threshold framework to estimation the number of supporting firms. The entry threshold model assumes that firms enter markets when they expect to make a profit and under which, as shown in Berry (1992), the equilibrium number of firms in the market can then be uniquely determined. In other words, a market will have n firms in equilibrium when $\pi_n > 0$ and $\pi_{n+1} < 0$, where π_n is the equilibrium profit for markets with n firms. We follow this entry threshold framework (see Equation 2 in Singh and Zhu 2008) and define the latent profit π_{nt} that a representative firm earns in equilibrium at period t when there are n firms in the market as follows

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[6] Table 5, based on the parameter estimation results of FDD market (see Table 2), presents the overall impact of the installed-user-base effect, $\Omega_{UB} = (\hat{\gamma} + \hat{\theta}_2 FB + \hat{\theta}_3 FB \times TIME)$, and the overall impact of the supporting-firm-base, $\Theta_{FB} = (\hat{\theta}_1 + \hat{\theta}_2 UB + \hat{\theta}_3 UB \times TIME)$, over time. The alternative way to examine the dynamic pattern of the supporting-firm-base effect is to directly incorporate the term FB × TIME in the Model 2. However, incorporating FB × TIME in the estimation creates high multicollinearity between the variable FB and FB × TIME, which leads to insignificant results for both variables. Therefore, in this study, we examine the dynamic pattern of the supporting-firm-base effect through its interaction with the installed-user base. As shown in Table 5, the interaction effect varies across time, which results in a time-varying supporting-firm base effect.

$$\text{(A1)} \quad \pi_{nt} = Y_t\lambda + \eta_1(N-1) + \eta_2(N-1)^2 + \tau_n = \overline{\pi}_n + \tau_n,$$

where Y_t captures the variables that influence a firm's demand and cost, which ultimately determines a firm's profit[7] The variable (N − 1) and its square term $(N-1)^2$ capture the potential nonlinear effects of previous number of firms (i e , [N − 1]) on market entry These are variables that a firm can observe when it makes the entry decision The error term τ_n captures the unobserved characteristics and is assumed to be independently distributed across markets and years and identical to each firm within a market (for detailed discussions, see Bresnahan and Reiss 1990, 1991)

We expect a nonlinear impact of the previous number of firms on firms' entry decisions for two reasons First, the literature has suggested a negative effect of the number of firms on market entry as a result of a competition effect (Singh and Zhu 2008) Second, as we discussed previously, in markets with network effects, the number of firms supporting the same standard may also generate a positive supporting-firm-base effect on consumers' product evaluation demand, which increases market demand and ultimately a firm's expected profit Taking both the negative competition effect and the positive supporting-firm-base effect into consideration, we expect a nonlinear effect on market entry of the number of supporting firms (i e , an increase in the supporting-firm base first encourages, but then discourages, market entry) This is because the supporting-firm-base effect is likely to dominate the competition effect in the early stage of market development when market uncertainty is high to consumers and the number of supporting firms is small, but the competition effect is more likely to dominate in the later stage of market development when the technology has obtained sufficient support from the industry

Under the assumption of independent and identical normal distribution τ_n, the probability of observing markets with n active firms can then be derived as follows

$$\text{(A2)} \quad \Pr(FB_t = n) = \Pr(\pi_{n,t} \geq 0 \text{ and } \pi_{n+1,t} < 0 \mid \pi_{n,t} > \pi_{n+1,t}) = \Phi(\overline{\pi}_{n,t}) - \Phi(\overline{\pi}_{n+1,t}),$$

and the probability of a market with no firms equals

$$\text{(A3)} \quad \Pr(FB_t = 0) = \Pr(\pi_{1,t} < 0) = 1 - \Phi(\overline{\pi}_{1,t}),$$

where $\overline{\pi}_{1,t}$, $\overline{\pi}_{n,t}$, and $\overline{\pi}_{n+1,t}$ are given in Equation A1, and $\Phi(\bullet)$ is the cumulative normal distribution function Finally, given the probability functions defined in Equations A2 and A3, the likelihood function is accordingly derived as follows

$$\text{(A4)} \quad L_t = \prod_{N_t=0}^{N_{max}} [\Pr(FB_t = N_t)],$$

where N_t is the number of observed supporting firms

Supporting-Firm-Base Equation Estimation

Empirical specifications To apply the entry threshold model to the FDD market, we provide the following empirical specifications for Equation A1 The latent profit function for each entrant in Equation A1 is empirically specified as follows

$$\text{(A5)} \quad \pi_{nt} = \lambda_1\overline{p}_{t-1} + \lambda_2 UB_{t-1} + \lambda_3 UB^2_{t-1} + \lambda_4 WG_{t-1} + \lambda_5 HUV_{t-1} + \lambda_6 LogPP_{t-1} + \lambda_7 M_t + \eta_1(N-1) + \eta_2(N-1)^2 + \tau_n = \overline{\pi}_n + \tau_n$$

Following Singh and Zhu (2008), we included the average market price of disk drives, $\overline{p}_{t-1}$, to capture its influence on firms' marginal profit We also included the user base and its square term in the equation to capture the user-base effect on demand, as suggested in Model 2 To capture variables influencing a firm's marginal and fixed costs, we incorporated wages per hour (WG_{t-1}) and the housing unit value (HUV_{t-1}) We used the variable of population in logarithm ($LogPP_{t-1}$) as a measure of market size Following Nair, Chintagunta, and Dube (2004), we also used the total sales in each FDD category across its product life cycle, subtracting the number of realized unit sales of each category from the previous year (M_t) as an another variable for the market potential of each FDD market

Data and estimation results We collected data for the estimation of our entry model (Equations A1–A2) from multiple sources We collected data for three variables from *Disk Trend Report* from 1976 to 1998 (1) the number of supporting firms for each technology in the FDD market, (2) the average market price $\overline{p}_{t-1}$, and (3) the market potential of each disk drive category (M_t) in each year We collected wages (dollars per hour) in the computer storage industry from *Manufacturing and Distribution, USA* (2003) from 1987 to 1998 and *Predicast Basebook* from 1976 to 1986 From the *Statistical Abstract of the United States*, we collected data for the population ($LogPP_{t-1}$) and the housing unit value (HUV_{t-1}) from 1976 to 1998 Table A1 reports the descriptive statistics of these variables We estimated the firm-base equations (Equations A1–A5) on the disk drive industry using the maximum likelihood estimation method We report the estimation results in Table A2

TABLE A1
Descriptive Statistics

Variable	M	SD
Average price of FDDs ($/1000 units)	2 711	5 254
Installed-user base (in millions)	59 155	117 961
Supporting-firm base	14 205	12 984
Wage ($/hour)	11 142	2 902
Housing unit value (1000$)	73 746	17 545
M_t (in millions of units)	244 285	134 681
Population (1000)	246 998	13 204
Sample size	83	

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[7] Firms have no information about variables such as their products and price in the profit function (Equation A1) before entry, therefore, we define a representative firm's profit (Equation A1) by exogenous market variables for entry decision making

TABLE A2
Estimation Results of Supporting-Firm Base Equation

Parameter	Estimate	SE
Intercept (λ_0)	714*	116
$\bar{p}_{t-1}$ (λ_1)	1 390*	252
UB_{t-1} (λ_2)	967*	117
UB^2_{t-1} (λ_3)	– 118*	034
WG (λ_4)	– 626*	117
$LogPP_{t-1}$ (λ_5)	475*	117
M_t (λ_6)	566*	117
HUV_{t-1} (λ_7)	–5 9e-09	8 2e-07
FB_{t-1} (η_1)	1 015*	012
FB^2_{t-1} (η_2)	– 116*	001
Log-likelihood value	–114 165	

$^*p <$ 01

Correcting for Endogenous Supporting-Firm Base

Having estimated the parameters in the firm-base equation (Equations A1–A5), we now derive the correction term that will be incorporated in the second-stage estimation of Model 2 Formally, we specify the correlation of error terms in Equation 2 and in the firm-base Equation A1 as follows

$$\text{(A6)} \qquad \begin{pmatrix} \varepsilon_{ijt} \\ \tau_n \end{pmatrix} \sim \text{BVN}\left[\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} 1 & \varphi \\ \varphi & \sigma^2 \end{pmatrix}\right],$$

where ε_{ijt} and τ_n are the error terms in the demand Equation 2 and firm-base Equation A1, respectively, and φ is the covariance between ε_{ijt} and τ_n The term BVN denotes the bivariate normal distribution Given the normal distributed error terms ε_{ijt} and τ_n, the conditional distribution of ε_{ijt} given τ_n is also normal, and its mean is $\varphi\tau_n$ Thus, given the observed number of supporting firms, FB_{t-1}, the error term ε_{ijt} can be represented as $E[\varepsilon_{ijt} \mid Y_t, N_t] = \varphi E[\tau_n \mid Y_t, N_t] + \zeta_{ijt}$ Accordingly, the demand Equation 2 can be specified as follows

$$\begin{aligned} \text{(A7)}\ u_{ijt} &= \beta_0 + \sum_k X_{ijk}\beta_k - \alpha p_{jt} + \gamma UB_{t-1} + \theta_1 FB_{t-1} \\ &+ \theta_2 FB_{t-1} \times UB_{t-1} + \theta_3 RINCMB_{t-1} + \theta_4 RSTECH \\ &+ \varphi E[\tau_n \mid Y_t, N_t] + \zeta_{ijt} = \bar{u}_{jt} + \varphi E[\tau_n \mid Y_t, N_t] + \zeta_{ijt} \end{aligned}$$

This is the equation we used in the second-stage estimation for the supporting-firm-base effect on demand, where $E[\tau_n \mid Y_t, N_t]$ is the correction term and φ is an additional parameter to be estimated in the second-stage estimation Finally, given the specification of the bivariate normal distribution between error terms ε_{ijt} and τ_n, the correction term $E[\tau_n \mid Y_t, N_t]$ can be derived as follows

$$E[\tau_n \mid Y_t, N_t] = \int_{-\bar{\pi}_n}^{-\bar{\pi}_{n+1}} \varsigma \frac{\phi(\varsigma)}{\Phi(\bar{\pi}_n) - \Phi(\bar{\pi}_{n+1})} d\varsigma,$$

where $\phi(\bullet)$ and $\Phi(\bullet)$ represent the density function and cumulative distribution function of normal distribution, respectively

APPENDIX B
Robustness of Results

Variable	Estimation with Correcting Endogeneity and Controlling Heterogeneity	
Price (α)	– 016*	7 7E-17
Installed-user base (mean $\bar{\gamma}$)	014**	2 0E-16
Installed-user base (SD δ_γ)	1 0E-18	8 2E-18
Supporting-firm base (mean $\bar{\theta}_1$)	087**	1 3E-15
Supporting-firm base (SD δ_{θ_1})	1 0E-17	1 9E-16
Firm base × user base (mean $\bar{\theta}_2$)	0003**	4 9E-18
Firm base × user base (SD δ_{θ_2})	1 0E-19	1 3E-18
Firm base × user base × TIME (mean $\bar{\theta}_3$)	–3 8E-05**	9 3E-19
Firm base × user base × TIME (SD δ_{θ_3})	1 0E-19	5 2E-19
RINCMB (θ_4)	2 195**	3 0E-14
RSTECH (θ_5)	2 444**	3 3E-14
Density (β_1)	4 376**	1 9E-14
Track to track (β_2)	093**	3 7E-15
D_{Sony} (β_3)	651**	2 3E-15
Error correction	– 209**	7 6E-15
Log-likelihood value	–1036 163	

$^*p <$ 05
$^{**}p <$ 01

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Richard A. Gooner, Neil A. Morgan, & William D. Perreault Jr.

Is Retail Category Management Worth the Effort (and Does a Category Captain Help or Hinder)?

Category management (CM) is challenging for retailers that sell thousands of products across hundreds of categories and often lack the resources and capabilities to manage all of them intensively. Some retailers respond by picking one supplier to be a "category captain" that manages the category—including rivals' brands—on their behalf. Others worry that influential captains will be opportunistic and that the benefits of intensive CM are simply not worth the costs. However, there is little conceptual development or empirical evidence concerning CM best practices. The authors develop a comprehensive model of retail CM based on a synthesis of field interviews and relevant literature, especially work on governance value analysis theory. Their test of the model using category and financial growth data from U.S. supermarket chains shows that more intensive CM improves results. Furthermore, use of a category captain increases CM effort and results, without increasing opportunism or problems with other suppliers. The authors also find that retailers with more resources are less likely to rely on help from a category captain, yet the level of retailer resources is not related to CM intensity. Thus, "go-it-alone" retailers do not deploy their own resources on CM and miss out on the corresponding performance improvements.

Keywords: interorganization relationships, governance, channels of distribution, supplier networks, brand management, retailing

In increasingly competitive markets, managers and scholars must rethink traditional approaches to creating and capturing value, including how interorganization relationships are handled (e.g., Cannon and Perreault 1999; Frazier et al. 2009; Palmatier, Dant, and Grewal 2007; Wathne and Heide 2004). Nowhere is this more evident than in the channel for consumer packaged goods (CPGs), in which category management (CM) is a key issue for both suppliers and retailers (e.g., Gajanan, Basuroy, and Beldona 2007; Lindbloom and Olkkonen 2006). Category management involves the allocation of resources within sets of complementary and/or competing brands to maximize planned outcomes (e.g., Basuroy, Mantrala, and Walters 2001; Morgan, Kaleka, and Gooner 2007) and involves the analysis of category-level data, setting goals for category performance, and the formulation and execution of plans to maximize category-level results (e.g., Desrochers, Gundlach, and Foer 2003; Dupre and Gruen 2004). While CM is common among CPG manufacturers, retailers typically sell thousands of products across hundreds of categories, and as a result, most lack the resources to intensively manage all the categories they sell. Some experts urge retailers to address their CM challenge and ramp up the intensity of their CM efforts by leveraging the resources and capabilities of a lead supplier—or even to designate a "category captain" supplier to manage the category (including rivals' brands) for them (e.g., Aastrup, Grant, and Bjerre 2007; Gruen and Shah 2000). However, this idea is controversial. There are anecdotal reports of successes, but many retailers fear that this idea carries significant risks, including opportunistic behaviors by lead suppliers such as manipulating data analyses to lead to CM decisions that favor their own brands at the expense of the retailer and other suppliers. Furthermore, in most categories, retailers work with multiple suppliers to provide required levels of consumer choice. Many retailers fear that giving one supplier an influential role in their CM will prompt damaging push-back from other suppliers, such as reducing trade allowances or delaying access to new products. Some retailers are also cautious because of public policy concerns that reliance on a category captain may inhibit competition and lower consumer welfare (e.g., Desrochers, Gundlach, and Foer 2003; Steiner 2001).

Therefore, retail CM is an important but problematic area for retailers and their suppliers, and it is challenging from both theoretical and public policy perspectives. Despite this, there is little empirical evidence on retail CM (Dhar, Hoch, and Kumar 2001; Gruen and Shah 2000). Most prior CM research has drawn on analytical models of

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channel behavior, and the limited empirical work has focused only on specific CM elements such as opportunistic supplier behaviors (Morgan, Kaleka, and Gooner 2007) or the appropriation of any incremental CM rents (Basuroy, Mantrala, and Walters 2001) Therefore, managers have no comprehensive evidence-based guidance regarding whether more intensive retail CM pays off and little insight into the costs and benefits of using a lead supplier to help their retail CM efforts This is unfortunate, because many retailers report having failed to make their CM efforts and associated supplier relationships work (e g , Howe 2006, Kumar 2005), and many retailers remain skeptical and even fearful of CM

Integrating field interviews and the literature, we develop a comprehensive new conceptual model of retail CM and its key antecedents and outcomes We test this model using data on 35 product categories from a representative sample of U S supermarket chains We complement this model test by contrasting the results achieved when retailers choose to rely (or not) on a category captain In combination, our results show that retailer skepticism about CM's benefits—and fears about relying on a category captain—are both unfounded We show that more intensive CM improves financial results and that retailers that allow a lead supplier more influence benefit from more intensive CM We also show that even when retailers possess the required CM resources, they frequently undermanage categories and, as a result, underperform Contrary to retailer fears, we find that, on average, a category captain is no more likely act opportunistically and actually provokes *less*—not more—damaging push-back response from other suppliers Our results provide important new insights into retail CM and illuminate several theoretically important but underresearched aspects of buyer–supplier relationships

We begin with a brief discussion of how our conceptual model was developed Then, we present our model of retail CM, its antecedents, and outcomes, along with formal hypotheses of relationships between constructs we identify as key to understanding retail CM We then describe our data collection and tests of the hypothesized relationships We report the results and their implications for theory, managerial practice, and public policy We conclude with a discussion of the limitations of our study and directions for further research

Conceptualization and Hypotheses

Theories advanced in marketing and management suggest myriad factors that could be relevant to understanding retail CM activities, the role or impact of suppliers in retail CM, and likely antecedents and consequences of different CM approaches (e g , Morgan, Kaleka, and Gooner 2007) However, no comprehensive framework for understanding CM exists To develop a conceptualization reflecting the specific context of retail CM and narrow the focus to only the key factors required for a comprehensive model, we first conducted qualitative fieldwork

After synthesizing academic and trade literature relevant to CM, we developed a semistructured telephone interview protocol based on discussions with a convenience sample of top managers involved in retail CM from four retailers and three CPG suppliers We included open-ended questions about different CM activities for supermarket retailers, the extent to which suppliers were involved in retail CM decisions and their execution, and the different costs and benefits of retail CM efforts We then used a snowball sampling approach to identify 49 managers (21 retail buyers and CMs, 11 CM consultants, 10 supplier managers, and 7 top retail executives) with whom we conducted in-depth telephone interviews The interviewees represented a wide range of retailers (ranging from those with as few as 3 stores to national chains with more than 400 stores), leading suppliers of food, beverage, perishable, and nonfood products, and consultants working for major consulting firms engaged in CM We also interviewed leaders of major trade associations and editors and analysts from the trade press These interviews helped us identify factors key to understanding retail CM and its antecedents and outcomes and to elicit managers' beliefs concerning cause and effect relationships among these factors

Multiple theories were potentially relevant to exploring different aspects of the conceptualization of retail CM that emerged in our fieldwork However, recent governance value analysis (GVA) extensions of transaction cost analysis (TCA) (e g , Ghosh and John 2005, 2009) have created a new theoretical lens that we viewed as being the single theory that most closely aligned with our original fieldwork-based CM conceptual model Therefore, we use GVA as a theoretical lens for exploring the relationships suggested in our model In essence, GVA combines the cost minimization calculus of TCA with the resource-based view insight that firm-specific resources drive realized strategy positions Consistent with GVA, we contend that retail CM is a governance mechanism that enables retailers and suppliers to organize and align their resources and transactions to promote and leverage cooperation in ways that create and claim value (cf Ghosh and John 1999) While no single study—especially the first one in a new research area—can offer a comprehensive test of GVA theory, we show that ideas that are distinctive to GVA theory help support and inform hypotheses about relationships among the constructs identified by our fieldwork as most important to understanding retail CM

Our fieldwork-based conceptualization suggests that in retail CM, retailers and their suppliers (1) have different resource profiles, (2) use these different resources to create and claim value with CM, and (3) are self-interested insofar as they seek to organize and align themselves in ways that both are efficient and deliver them the greatest total value Therefore, the central problem in retail CM is how to efficiently and effectively coordinate the category-level actions of these different parties when competition among retailers and between suppliers combines with dynamic consumer demand to require continuous adaptation Creating value through retail CM requires close retailer–supplier cooperation, but the different resource profiles and self-interests between the parties involved also creates tensions in how any value created is claimed and by whom

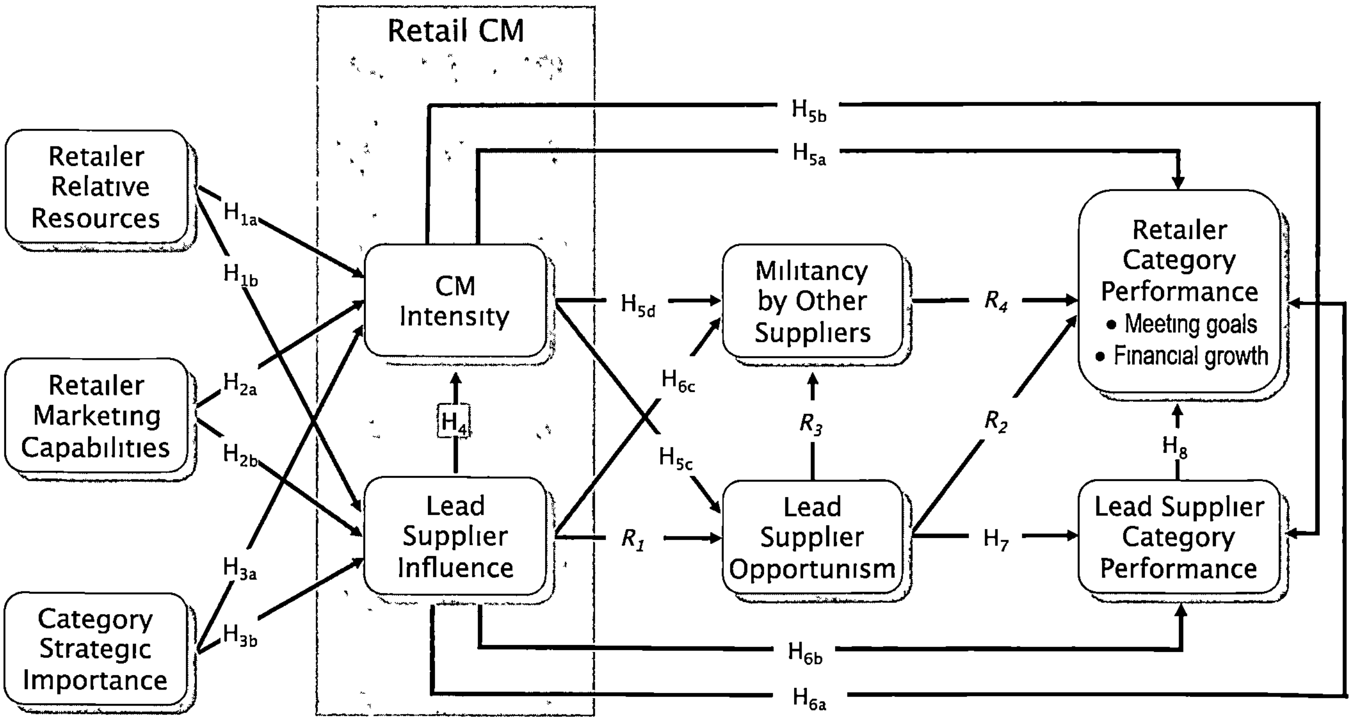
In the following section, we synthesize our qualitative insights with those available from the GVA and other relevant literature to develop the model summarized in Figure 1. Our model focuses on when and how the use of a CM governance mechanism (lead supplier influence) generates resources for retail CM (the intensity with which CM activities are performed in a category) and the resulting benefits (both retailer and lead supplier category performance outcomes) and problems created (lead supplier opportunism and militant push-back behaviors by other suppliers). We first describe our conceptualization of retail CM, and then we discuss formal hypotheses of the relationships represented in Figure 1. Four of the relationships between the constructs in Figure 1 have been examined in a related study of supplier opportunism in the U.K. supermarket supply chain (Morgan, Kaleka, and Gooner 2007). Therefore, we do not develop formal hypotheses for these four relationships here; however, we include them in our model and briefly compare the path coefficients from the two different studies in our discussion of results.

Retail CM

Two key aspects of retail CM are at the heart of our model (Figure 1). First is CM intensity, or the time and effort devoted to retail CM activities, regardless of whether they are performed by the retailer or with the help of one or more suppliers. This may range from devoting considerable resources to detailed category-level analyses, planning, and execution designed to maximize category performance to a simple "straight rebuy" or "resupply" situation. Second, lead supplier influence involves the role of the supplier that has the most influence on the retailer's CM. This may range from a retailer-designated category captain that manages the category on the retailer's behalf to a supplier that has little more influence than any other on a retailer's CM decisions and actions. Thus, our conceptualization of retail CM comprises two continua—CM intensity and lead supplier influence—encompassing situations in which little or no retail CM activities are performed and the retailer simply relies on "market" competition among suppliers to get whatever help and support is available from each supplier, as well as situations in which a retail category is intensively managed, sometimes by leveraging the resources of an influential lead supplier. Next, we elaborate on these two central retail CM constructs.

Category management intensity is the extent to which CM activities (i.e., category-level goal setting, analysis, planning, and execution) are performed in a specific product category. From a GVA perspective, CM intensity involves resource deployments designed to create valuable strategic positions among consumers by coordinating the efforts of the retailer and all the suppliers to the category. Such retailer–supplier coordination in CM includes analyzing assortments of manufacturers' and store-brand stockkeeping units (SKUs) to maximize category-level profits, planning and executing supporting shelf-sets, promotional schedules, feature advertising, endcap allocations, cross-merchandizing, and so on, and logistical activities, including inbound-delivery timing and quantity/product mix required for retailer warehouse and direct-to-store deliveries, supplier in-store product-handling, reverse logistics, and so on. Because consumers' needs and rivals' strategies are constantly shifting, effective retail CM requires frequent adaptation.

FIGURE 1
Model of Retail CM



However, even large supermarket chains generally lack the resources to intensively manage all the categories they sell, though competitive pressures make it risky not to intensively manage a product category Therefore, retailers face difficult decisions involving how much time, effort, and other resources they will allocate to CM in each of the categories they sell and how to deal with CM resource shortfalls

The second key aspect of retail CM is lead supplier influence The lead supplier is the supplier to the category that has the most influence (relative to other suppliers) over the retailer's CM decisions and actions (Morgan, Kaleka, and Gooner 2007) From a GVA perspective, lead supplier influence is a form of plural governance It is hierarchical in terms of decision control and rights over the development and execution of the retailer's category-level strategies (e g , Grossman and Hart 1986, Heide and John 1992) At the same time, lead supplier influence is also a relational governance form in that it allows the lead supplier and retailer to cooperate without formal agreements or contracts, which are deliberately avoided because of antitrust concerns A retailer that faces resource deficits and wants to leverage a lead supplier's resources and capabilities to create and capture greater value through CM may allow that supplier to wield a great deal of influence This extends to the supplier operating as a category captain that effectively manages the category and its suppliers on the retailer's behalf At the other end of the continuum, a retailer may not cede extra influence or control over CM to any supplier, in which case the lead supplier has only slightly more influence than any other and may even simply be "first among equals " This occurs, for example, when retailers see downstream costs and risks that would lower their ability to claim any joint value created by relying on one highly influential supplier

Interviewees emphasized that even when a lead supplier has a great deal of influence (or is even designated as a category captain), the retailer usually also works with and carries products from other suppliers in the category to give consumers the choices they want As a result, a highly influential lead supplier directly affects the marketing of its own brands, the brands of rival category suppliers, and even the retailer's private label products Thus, a retailer's decision to use a lead supplier in its CM efforts also affects its relationships with competing suppliers in the category, most of which maintain an ongoing relationship with the retailer

Antecedents of Retail CM

Our fieldwork highlights three key resources required for effective retail CM knowledge of category consumers and their buying behavior, financial resources for making and executing CM decisions, and brand awareness among consumers in the category Interviews suggest that relative to suppliers, retailers typically face resource deficits in these key CM resources because suppliers specialize in fewer categories and, in general, earn higher margins The trade literature suggests that a retailer can increase its available CM resources by leveraging its relationship with a lead supplier (e g , Kumar 2005) However, our interviews revealed significant retailer fears of losing direct control over their CM activities Governance value analysis theory posits that such fears may be well founded because leveraging a supplier's resources can create a value-claiming benefit for the supplier (e g , Ghosh and John 2009) Thus, retailers must trade off the potential costs of decreased CM value-claiming rights against the potential CM value-creating benefits of having access to superior CM resources Our fieldwork suggests that retailers are only willing to cede influence in their CM to a supplier in return for access to CM resources that are clearly superior to those available in-house Therefore, we posit the following

> H_1 The greater the retailer's CM resources relative to those of the lead supplier to the category, (a) the greater is the CM intensity, and (b) the lower is the level of lead supplier influence on retailer CM

The literature distinguishes between resources such as those identified previously and capabilities—the processes by which such resources are combined and deployed to achieve positional advantage among consumers (e g , Vorhies and Morgan 2005) Capabilities can affect not only a firm's ability to engage in particular tasks but also its "make or buy" decision of who should perform those tasks (e g , Argyres 1996) From this perspective, our interviews highlighted the role of the retailer's marketing capabilities in its CM decision making Whether necessary retail CM resources are available in-house or are accessed through relationships with an influential lead supplier, retailer interviews indicate that strong marketing capabilities are required to effectively engage in retail CM Consistent with the GVA logic outlined previously for CM resources, possession of strong marketing capabilities should mean that retailers are both more able to effectively engage in intensively managing a product category and less likely to have to seek such capabilities from a lead supplier This suggests the following

> H_2 The greater the retailer's marketing capabilities, (a) the greater is the CM intensity and (b) the lower is the level of lead supplier influence on retailer CM

The literature advocates that retailers allocate their scarce CM resources to large, profitable, or traffic-building product-categories that are most important to achieving their overall objectives (e g , Blattberg and Fox 1995) A retailer that does not have needed resources and capabilities in-house can either seek CM help from one or more suppliers or simply pay less attention to the category According to GVA, retailers are more likely to leverage supplier resources in strategically important categories because these are where the most joint value can be created, which may best offset any increased supplier value-claiming costs (Ghosh and John 1999) However, suppliers face their own resource allocation decisions (Gruen and Shah 2000) Our interviews indicate that in line with GVA, suppliers prioritize retail CM opportunities that both enhance their influence with the retailer and provide advantage over rival suppliers Suppliers evaluate not only category characteristics (e g , dollar sales) but also other drivers of a category's importance to the retailer (e g , traffic-building) in determining the extent to which they are willing to invest in supporting a retailer's CM efforts Therefore, we posit the following

H_3 The more strategically important the product category to the retailer, the greater is the (a) CM intensity and (b) lead supplier influence on retail CM

Lead Supplier Influence and CM Intensity

As outlined previously, retailers often suffer deficits in resources and capabilities needed for effective CM and are commonly advised to seek help from an influential lead supplier to bolster their CM efforts (e g , Blattberg and Fox 1995) From a GVA perspective, this suggests that a retailer's need for the resources required to create value through CM can be such that the retailer will cede significant influence over CM decisions to a lead supplier in return for the resources This is consistent with the GVA literature in suggesting that given that the central adaptation requirements of retail CM are noncontractible, the CM "decision rights" should be secured by the party that can produce the greatest systemwide adaptation value (e g , Ghosh and John 2009, Grossman and Hart 1986) Our interviews suggest that when this occurs, the lead supplier is more willing to deploy its own resources to help execute the retail CM plans it helps shape Thus, allowing a lead supplier greater influence can lead to an enlarged pool of CM resources and capabilities for the retailer (e g , Corsten and Kumar 2005) Therefore, we posit the following

H_4 The greater the lead supplier's influence on the retailer's CM, the greater is the CM intensity

Consequences of Retailer CM

Trade analysts argue that retail CM offers category-level benefits for both the retailer and suppliers, with claims of sales increases of up to 11% and cost reductions of as much as 2% of sales (e g , Cannondale Associates 1999, Freedman, Reyner, and Tochtermann 1997) From a GVA perspective, such potential benefits represent the realized adaptation value of retailer–supplier coordination that results from the new information and insight created by analyzing current and potential performance at the retail category level Effective retail CM creates synergies by coordinating the marketing efforts of individual SKUs, brands, and suppliers, which can result in both enhanced systemwide decision making and lower costs (e g , Blattberg and Fox 1995, Desrochers, Gundlach, and Foer 2003) From a value-claiming perspective, our fieldwork suggests that the value created by retail CM is not fully appropriated by either the retailer or any single supplier—not least because of sensitivity to antitrust concerns

Nonetheless, our interviews suggest that retailers usually claim the majority of the value that CM creates This is because from a "what gets measured gets done" perspective, analyzing category-level data to set goals and track performance in retail CM provides the retailer with a control mechanism needed to both improve and monitor category sales and cost performance (e g , Anthony 1988, Simons 1995) Thus, our fieldwork indicates that CM is a mechanism whereby the retailer can have sufficient category-level control to ensure that it claims a significant amount of the value created by coordinating its efforts with those of its suppliers

Our interviews indicate that suppliers may also benefit from more intensive retail CM For example, when more intensive CM efforts increase category-level sales, it was suggested that lead supplier sales usually increase at least proportionately to their category share Furthermore, if SKUs of low-performing brands are dropped—as is often the case when a category is more intensively managed—lead suppliers, which often market leading brands, usually benefit From a GVA perspective, this suggests that while retail CM creates significant value, it does not allow all of this value to be claimed by the retailer—even if the retailer has the necessary resources to make and execute appropriate CM decisions without the help of a supplier However, more intensive CM does give retailers greater category-level overview and insight, which enhances the retailer's ability to monitor its suppliers Our interviews suggest that such enhanced scrutiny provides a disincentive for lead suppliers to engage in opportunistic behaviors

The ability to claim value created by retail CM efforts may also extend to other suppliers Our interviews suggest that better coordination through CM can increase the efficiency of all suppliers' marketing efforts and is therefore welcomed even by suppliers that are not the lead supplier to the category This is consistent with prior evidence that when specific investments are modest (as for nonlead suppliers), buyer–supplier coordination can improve channel efficiency (e g , Buvik and John 2000) As a result of retail CM not allowing the retailer and lead supplier to claim all its value-creation benefits, managers indicated that retailers could expect fewer push-back and acting-out-type militant behaviors from other suppliers in implementing their CM plans Such militant behaviors are consistent with a more active and negative framing of TCA conceptualizations of acquiescence (i e , militant behaviors are those that deliberately impede effective and efficient supply chain management) among less influential suppliers in a supply chain (e g , Williamson 1991) This leads us to posit the following

H_5 The greater the CM intensity, the better are the category performance outcomes for both (a) the retailer and (b) the lead supplier, and the lower are the levels of (c) lead supplier opportunism and (d) militancy by other suppliers

In addition to the hypothesized indirect benefits to the retailer and all category suppliers from leveraging lead supplier resources through enhanced retail CM intensity, our interviews also suggest additional direct retailer and lead supplier benefits From a retailer perspective, although CM intensity involves the extent to which CM activities are undertaken for a product category, retailer interviews indicate that the quality of CM activities are also often enhanced when they leverage the resources and capabilities of a lead supplier Retail managers believe the CM planning and implementation skills available from a carefully selected lead supplier deliver category-level performance benefits beyond those accruing from greater CM intensity alone For lead suppliers, our interviews indicate that a lead supplier that is influential in the retailer's CM often gains preferential shelf-facings, larger assortments, promotional display space, and other advantages that increase its category share This is consistent with evidence in other channel settings of a relationship between supplier decision-making participation and support and a buyer's resource allocations (e g , Anderson, Lodish, and Weitz 1987) In GVA terms, a direct relationship between a lead supplier's CM influence and its category performance suggests that influence on retail CM provides the lead supplier with a value-claiming benefit that is not available to other suppliers Indeed, our interviews indicate that this goal motivates lead suppliers to share their CM resources and expertise with the retailer

However, there may also be downside costs associated with lead supplier influence on retail CM For example, Morgan, Kaleka, and Gooner (2007) find a positive relationship between a lead supplier's influence and its opportunism in a study of the U K supermarket supply chain Therefore, we include this path in our model (R1) Our interviews suggest that another likely cost of lead supplier influence is its effect on other suppliers A high level of CM influence by one supplier is unlikely to be welcomed by its rivals—as one manager commented, "No one—including us—responds happily to a competitor making decisions for their brand " Transaction cost analysis theory posits that a key outcome of one supplier having greater power in a firm's supply chain is less cooperation among the other suppliers (e g , Rindfleisch and Heide 1997, Williamson 1991) Interviews reveal that retailers fear that using a lead supplier in CM may provoke even more active forms of militant behaviors by other suppliers Such responses may be expected if a lead supplier is perceived by other suppliers to use its CM influence to gain, for example, unwarranted preferential shelf placements for its own brands or the most beneficial promotional slots Some retailers indicated that they avoid relying on a lead supplier in their CM precisely because they fear retaliation from other suppliers that may withhold promotional support, market information, or other resources required to effectively manage the category Thus, we posit the following

H_6 The greater the influence of the lead supplier on the retailer's CM, the better are the category performance outcomes for both (a) the retailer and (b) the lead supplier, and (c) the greater the level of militancy by other suppliers

Consequences of Lead Supplier Opportunism and Militancy by Other Suppliers

The literature and our interviews suggest that both lead supplier opportunism and militancy by other suppliers toward the category give rise to costs that can create significant channel inefficiencies (e g , Rindfleisch and Heide 1997, Williamson 1993) For example, Morgan, Kaleka, and Gooner (2007) report that lead supplier opportunism has a direct negative effect on the performance of U K grocers They also posit an indirect effect through increased militancy by other suppliers but find that this militancy has an insignificant effect on retailer performance We include paths for these relationships in our model (R2 and R3/R4, respectively) However, our interviews also suggest costs to the lead supplier For example, retailers interviewed believe that they can usually detect and punish opportunistic behavior by lead suppliers There are obvious negative supplier performance implications when a retailer punishes an opportunistic lead supplier by terminating its influential role in the retailer's CM Thus, we posit the following

H_7 The greater the level of lead supplier opportunism, the lower is the category performance of the lead supplier

Relationship Between Lead Supplier Outcomes and Retailer Outcomes

Finally, our interviews reveal that from a value-claiming perspective, retailer–lead supplier CM relationships are informal and do not rely on formal governance agreements and controls Governance value analysis indicates that such relational approaches can be appropriate when facing adaptation and coordination needs such as those associated with retail CM (Ghosh and John 1999) The literature suggests that when retailer–lead supplier CM relationships are formed to maximize mutually beneficial outcomes, improved lead supplier outcomes should also lead to improved outcomes for the retailer (e g , Bergen, Dutta, and Walker 1992, Macneil 1980) Furthermore, our interviews suggest that suppliers are increasingly competing with one another to win the position of influence on retailer CM Suppliers recognize that they enjoy this position at the retailer's pleasure and that both retailer and supplier CM outcomes can be observed by the retailer A lead supplier cannot simply improve its own performance at the expense of the retailer Rather, consistent with the channel influence literature (e g , Anand and Stern 1985), most suppliers believe that retailers simply choose to work on retail CM with the supplier that they expect to deliver them the best economic outcomes Both retailer and supplier managers interviewed agree that if an influential lead supplier can enhance its own category performance, it is highly motivated to ensure similar gains for the retailer, because that is what will enable that supplier to maintain its position of CM influence This suggests the following

H_8 The lead supplier's category performance outcomes are positively associated with the retailer's category performance outcomes

Research Method

No secondary data are available for the key constructs relevant to testing our model (Figure 1) In addition, retail CM often differs among product categories, even within the same retail chain (Dhar, Hoch, and Kumar 2001), so any research in this arena must consider a wide range of categories Therefore, we adopted a two-tier survey data collection research design to collect data from a large number of supermarket chains on 35 product categories identified as representative of those sold by supermarket retailers These categories appear in Table 1, ranked in descending order according to composite estimates of U S national sales volume

TABLE 1
Sample of Representative Food and Nonfood Product Categories

Sampling Group	Sales Rank[a]	Product Category	Mean Strategic Importance[b]
Group 1	1	Snacks/salty snacks	6 25
	2	Disposable diapers	4 95
	3	Pet care	5 05
	4	Bakery products	6 00
	5	Carbonated beverages	6 56
	6	Cereals	5 67
	7	Cookies and crackers	5 72
Group 2	8	Laundry detergents/bleach	4 91
	9	Cough and cold remedies	4 67
	10	Oral hygiene	4 07
	11	Bottled water	4 20
	12	Ice cream	5 19
	13	Fresheners/deodorizers	2 81
	14	Deodorant	3 19
Group 3	15	Household cleaners	2 94
	16	Baby foods, formulas, and electrolytes	4 42
	17	Coffee	5 62
	18	Soap/bath needs	3 11
	19	Hair care	4 29
	20	Candy	4 40
	21	Desserts, gelatins, and pudding mixes	2 98
Group 4	22	Film and cameras	5 58
	23	Milk	5 77
	24	Butter and margarine	3 68
	25	Cheese	5 22
	26	Pasta	4 63
	27	Spices and seasonings	3 40
	28	Yogurt	3 36
Group 5	29	Vitamins	3 10
	30	Toilet tissue	5 17
	31	Jams, jellies, and spreads	3 18
	32	Soups	3 36
	33	Sugar and sugar substitutes	2 81
	34	Shortening and oil	2 69
	35	Flour	2 11

[a] U S supermarket sales volume based on a composite of ACNielsen and Information Resources Inc data

[b] As rated by the retailers in our sample using a seven-point scale ("least" to "most")

Survey Population and Responses

The *Progressive Grocer* (2004) *Marketing Guidebook* lists all 590 U S supermarket buying offices (which house and support buyers and category managers) Many supermarkets have policies against releasing information about suppliers and participating in research Therefore, we faxed a personalized letter to the president or chief executive officer of each buying office explaining the research, requesting participation, and offering a report with benchmark results in return To make providing data more manageable, we asked each buying office to provide data on only five product categories by randomly selecting one category from each of the five (ordered) groupings in Table 1 Then, we sent each buying office president a cover letter along with five questionnaires for those categories We asked the president to give the category-specific questionnaire to the manager most familiar with the supermarket's business and suppliers in that category Thus, each retailer received questionnaires for different categories that represented a range of sales volumes, and each questionnaire was completed by the most knowledgeable manager

We received 359 completed questionnaires from 107 separate buying offices, we subsequently excluded 12 questionnaires because of missing data The response rate represents 21% of the retailers in our population, providing responses for an average of more than three categories per retailer We obtained data from retail chains that are collectively responsible for approximately 60% of U S supermarket sales and 46% of all U S grocery sales We also obtained good coverage of the 35 categories selected for our sample The average number of responses per category was 10, some categories had up to 15 responses, and the lowest number of responses was 7 The lead suppliers identified by respondents accounted, on average, for 47 4% of the retailers' category sales and had been supplying them for an average of 18 5 years

Tests for nonresponse bias included a comparison of secondary data for buying offices that participated in our research with those that did not, which indicated no significant differences in dollar sales and number of stores operated We also compared the mean scores for all constructs between early and later respondents (those responding before and after the median date of response) and found no significant differences between the two groups

One year after the initial survey, we contacted the presidents of the participating buying offices again and asked for objective financial growth performance data (percentage change in sales, profit, and market share over the past 12 months) for each of the five categories We received these data for 256 of the 347 (74%) retailer product categories for which we had survey data

Measures

Many of the constructs in Figure 1 are new to this research design, so for these we combined insights from our fieldwork and the literature to develop questionnaire items and then used standard statistical tools to evaluate them To enhance face validity, we refined the wording and content of an initial set of questionnaire items and instructions according to feedback from six industry managers These were then further refined on the basis of a pretest of 20 category managers/buyers randomly selected from our general population After responding to questions about other lead supplier characteristics, we also asked the retailer's category manager to indicate if the lead supplier was considered the retailer's "category captain" for the category Our lead supplier opportunism measure extends Brown, Dev, and Lee's (2000) scale using insights from our fieldwork Our measure of militancy by other suppliers is a more active and negative framing of the acquiescence measure developed by Morgan and Hunt (1994) Our fieldwork and the literature indicate that category objectives vary among retailers (e g , Gruen and Shah 2000) and even between categories for the same retailer (e.g., Dhar, Hoch, and Kumar 2001). In measuring retailer category performance, we therefore asked respondents to rate category performance relative to their objectives over the past year using four seven-point semantic differential scales. As noted previously, 12 months later we also obtained data covering the subsequent financial growth performance of 256 of the 347 categories for which we collected initial survey data. Table 2 lists the constructs, respondent questions, scale items, and anchors. Table 3 provides a correlation matrix for our constructs.

Assessment of Measures

We used confirmatory factor analysis (CFA) to assess our measures (e.g., Gerbing and Anderson 1988). Our measurement model fit well with the data ($\chi^2 = 1225.5$, d.f. = 665, $p < .001$, incremental fit index [IFI] = .957, Tucker–Lewis index [TLI] = .949, comparative fit index [CFI] = .957, and root mean square error of approximation [RMSEA] = .049). The composite reliabilities for the scales ranged from .85 to .96 (see Table 2), suggesting excellent reliability. The strong loadings and significant t-values for each item on the constructs they are intended to represent (Table 2) support the convergent validity of our measures (e.g., Anderson and Gerbing 1988). For each possible pair of constructs we compared chi-square statistics in measurement models in which the covariance between the two constructs was allowed to vary and then fixed at one (e.g., Bagozzi, Yi, and Phillips 1991). Changes in chi-square were far greater than the critical value in each case, supporting discriminant validity in each model. We also computed the average variance extracted (AVE) values of each construct. These ranged from 58% to 85%, while the shared variances between the constructs ranged from 0% to 46%, indicating discriminant validity among our constructs (e.g., Fornell and Larcker 1981). We evaluated the convergent validity of our retailer category performance measure using the objective financial growth performance data on percentage changes in sales, profit, and market share for each surveyed product category. These measures were significantly correlated ($p < .001$) with the meeting retailer category goals performance scale with coefficients of .335, .527, and .539, respectively.

Hypothesis Testing

We tested our hypotheses using structural equation modeling (SEM). We controlled for measurement error using full SEMs in which we estimated the nine constructs and specified relationships between them (Figure 1) simultaneously. We estimated two separate models. The first used the full sample and the meeting retailer category goals performance dependent measure, and the second used the subset of the sample for which we had the follow-up objective financial growth data, using the three growth indicators to estimate a single latent dependent measure. For each model, we estimated all the paths shown in Figure 1 and also included a same-source factor to control for possible common method bias (e.g., Netemeyer et al. 1997); when we excluded a same-source factor , the substantive results for both models remained essentially the same.

To account for potential CM policy differences between retailers, we also controlled for retailer-specific fixed effects on the CM variables in our model. Specifically, we regressed dummy variables for the retail chains onto the indicants of the CM intensity and lead supplier influence latent constructs and then subtracted the portion of the indicants that was explained by the chain effects before computing the constructs. The results are substantively the same as when the retailer fixed effects are not included, but the addition of this control step enhances confidence in our results.

As Table 4 shows, the structural equation models—both for retailer category financial growth and also for meeting retailer category performance goals—fit the data well; the IFI, CFI, and TLI statistics are all well above .9 and RMSEAs are well below .08. The models explain 49% of the variance in retailers' meeting category goals performance and 23% of the variance in retailers' objective financial growth. We also compared our hypothesis-testing models with more complex models that introduced additional paths not shown in Figure 1. These neither significantly increased model fit nor enhanced understanding of retail CM. Therefore, the SEMs based on the relationships in Figure 1 provide stable and parsimonious estimates of the multivariate relationships in our data.

To provide additional insights, we supplement the SEM results with an analysis of variance to evaluate differences in means (for all the variables in our model of retail CM) between CM situations in which the retailer is relying on a category captain and those in which the lead supplier is not a category captain. Although this analysis is descriptive rather than a test of the underlying causal mechanisms, it is a useful supplement to our SEM analysis in that it provides additional insights into a central question in retail CM practice—that is, on the conditions in which retailers rely on a category captain and on the results that category captains produce.

Results and Discussion

Table 4 provides coefficients for all the paths in the model we tested. To aid the interpretation of our findings, we conducted follow-up interviews in which we discussed our results with 24 managers (17 of whom participated in our survey data collection). When appropriate, we include insights from these follow-up interviews in our subsequent discussion.

SEM Hypothesis Testing Results

H_{1a}, which suggests a positive relationship between the retailer's relative CM resources and CM intensity, is not supported in either the meeting category goals or the objective financial growth SEM model. However, the H_{1b} relationship between the retailer's relative CM resources and lead supplier CM influence is strongly supported in both models, with coefficients of –.609 and –.638 ($p < .001$), respectively. Conversely, the H_{2a} posited relationship between retailer marketing capabilities and CM intensity is supported in both models with coefficients of .180 and .178 ($p < .001$), respectively, while the hypothesized negative

TABLE 2
Constructs and Measure Assessment

Constructs, Questions, and Items (All Measured on Seven-Point Scales)	Composite Reliability	AVE	Standardized Loading
Retailer's Relative Resources			
Please indicate the extent to which your firm has more or less of each of the following when compared to the resources of the supplier who has the most influence on how you manage this category ("much less" to "much more")	95	84%	
•Knowledge of consumers who shop this category of products			92
•Financial resources available for this category of products			86
•Insight into consumer buying habits for this category of products			96
•Level of brand awareness with consumers who shop this category of products			92
Retailer Marketing Capabilities			
This store or chain ("strongly disagree" to "strongly agree")	85	67%	
•Has a reputation with suppliers as a very capable marketer			73
•Is a sophisticated marketing organization			84
•Possesses strong marketing capabilities			88
Category Strategic Importance			
This particular category ("strongly disagree" to "strongly agree")	91	71%	
•Offers a higher gross margin percentage			54
•Acts as a "traffic builder" for the store			94
•Generates much larger dollar sales than other categories			90
•Is key to our ability to compete effectively			93
CM Intensity			
Please indicate the total amount of time and effort devoted to each of the following activities for the set of products in this category at your chain, taking into consideration the total work done by you, others in the company, and/or by one or more suppliers ("none" to "a great deal")	91	58%	
•Analyzing pricing			75
•Determining the impact of special displays			79
•Analyzing profitability of individual SKUs			88
•Evaluating private label products			53
•Implementing promotion or advertising plans			85
•Adjusting logistical arrangements			61
•Changing the assortment of SKUs			80
•Developing detailed category performance objectives			83
Lead Supplier Influence			
Considering this category of products, the supplier who has the most influence ("strongly disagree" to "strongly agree")	95	81%	
•Has significant responsibility for execution in this category			85
•Has a big impact on category goal setting			96
•Strongly influences the planning of marketing initiatives			96
•Significantly influences how other suppliers' SKUs are marketed			83
•Has significant input into the analysis done for this category			88
Lead Supplier Opportunism			
Considering this category of products, the supplier who has the most influence ("strongly disagree" to "strongly agree")	90	69%	
•Alters facts to suit their needs			84
•Often acts to benefit itself at our expense			87
•Gives complete, even unfavorable, information (reverse scored)			73
•Lacks integrity when not closely monitored			88
Militancy by Other Suppliers			
Please indicate whether there has been more or less of each of the following behaviors on the part of suppliers for this category other than the most influential supplier ("much less" to "much more")	96	85%	
•Sabotaging good ideas from another supplier			93
•Arguing with my decisions			84
•Obstructing programs that we initiate			96
•Interfering with what needs to be done to meet our objectives			95
Lead Supplier Category Performance			
Please indicate the extent to which each of the below has increased or decreased ("big decrease" to "big increase" anchors with "about the same" midpoint)	89	67%	
•Most influential supplier's total category shelf space			79
•Most influential supplier's share of category business			90
•Ads, displays and features for most influential supplier's products			81
•Most influential supplier's profits from this category at your store			78

TABLE 2
Continued

Constructs, Questions, and Items (All Measured on Seven-Point Scales)	Composite Reliability	AVE	Standardized Loading
Retailer Category Performance			
Please indicate your assessment of the category's performance versus objectives during the past year (semantic differential)	95	83%	
•"Excellent" to "poor"			93
•"Well short of goal" to "far exceeded goal"			90
•"Outstanding" to "unsatisfactory"			94
•"Improving" to "getting worse"			88

TABLE 3
Construct Intercorrelations

Construct		1	2	3	4	5	6	7	8	9
1	Retailer relative resources	1 0								
2	Retailer marketing capabilities	258**	1 0							
3	Category strategic importance	–152**	167**	1 0						
4	CM intensity	–185**	214**	677**	1 0					
5	Lead supplier influence	–607**	–073	350**	425**	1 0				
6	Lead supplier opportunism	–063	–263**	–127*	–046	–014	1 0			
7	Militancy by other suppliers	–037	–078	016	–152**	–128*	144**	1 0		
8	Lead supplier category performance	–288**	059	387**	393**	447**	–225**	–006	1 0	
9	Meeting retailer category goals	–174**	200**	537**	604**	451**	–183**	–116*	482**	1 0
10	Objective category financial growth	–029	102	380**	436**	246**	–058	–134*	343**	551**
11	Category captain lead supplier	–498**	–111*	207**	307**	773**	–035	–204**	312**	178**

*p < 05
**p < 01

TABLE 4
Standardized Path Coefficients for Two Structural Equation Models

Paths Modeled				Retailer Category Performance Dependent Variable: Meeting Retailer Category Goals	Retailer Category Performance Dependent Variable: Objective Financial Growth
H$_{1a}$	Retailer's relative resources	→	CM intensity	017	119
H$_{1b}$	Retailer's relative resources	→	Lead supplier influence	–609***	–638***
H$_{2a}$	Retailer marketing capabilities	→	CM intensity	180***	178***
H$_{2b}$	Retailer marketing capabilities	→	Lead supplier influence	056	047
H$_{3a}$	Category strategic importance	→	CM intensity	545***	572***
H$_{3b}$	Category strategic importance	→	Lead supplier influence	242***	220***
H$_{4}$	Lead supplier influence	→	CM intensity	342***	425***
H$_{5a}$	CM intensity	→	Retailer category performance	485***	338***
H$_{5b}$	CM intensity	→	Lead supplier category performance	153**	184**
H$_{5c}$	CM intensity	→	Lead supplier opportunism	016	073
H$_{5d}$	CM intensity	→	Militancy by other suppliers	–221***	–185*
H$_{6a}$	Lead supplier influence	→	Retailer category performance	139*	–045
H$_{6b}$	Lead supplier influence	→	Lead supplier category performance	396***	401***
H$_{6c}$	Lead supplier influence	→	Militancy by other suppliers	–067	–075
R$_{1}$	Lead supplier influence	→	Lead supplier opportunism	019	025
H$_{7}$	Lead supplier opportunism	→	Lead supplier category performance	–143*	–071
R$_{2}$	Lead supplier opportunism	→	Retailer category performance	–099*	–006
R$_{3}$	Lead supplier opportunism	→	Militancy by other suppliers	259***	241***
R$_{4}$	Militancy by other suppliers	→	Retailer category performance	–026	–122
H$_{8}$	Lead supplier category performance	→	Retailer category performance	181***	161*

Fit Indexes

Meeting Retailer Category Goals Model
χ^2 = 1303 84, d f = 681, p < 001, IFI = 952, CFI = 952, RMSEA = 051

Objective Category Financial Growth Model
χ^2 = 1311 74, d f = 644, p < 001, IFI = 924, CFI = 923, RMSEA = 068

*p < 05
**p < 01
***p < 001

relationship with lead supplier CM influence in H_{2b} is not supported in either model H_{3a} and H_{3b}, which link category strategic importance with CM intensity and lead supplier CM influence, are strongly supported, with coefficients of 545 and 572 ($p < 001$) and 242 and 220 ($p < 001$), respectively

In terms of the relationship between the two components of retail CM at the heart of our model, our results strongly support H_4, with path coefficients for the lead supplier influence–retail CM intensity relationship of 342 and 425 (both $p < 001$), respectively, in the meeting retailer category goals and objective financial growth models This supports industry analysts' recommendations that retailers' CM resource deficits can be overcome through CM relationships with lead suppliers, and the GVA insight that leveraging a lead supplier's resources and capabilities into increased retail CM intensity involves giving the supplier influence over the retailer's CM decisions and actions in return

From a retail CM benefits perspective, the path coefficients of 485 and 338 (both $p < 001$) strongly support H_{5a}, which links CM intensity with retailer performance in both the meeting retailer category goals and objective financial growth models Both models also support H_{5b}, which links CM intensity with the lead supplier's category performance, with coefficients of 153 and 184 (both $p < 01$), respectively Moreover, coefficients of – 221 ($p < 001$) and – 185 ($p < 05$) support the negative effect of more intensive CM on militant behaviors by other suppliers (H_{5d}) However, we find no support for H_{5c}, which posits a negative link between CM intensity and lead supplier opportunism As we discuss subsequently, this may be because the absolute level of opportunism is low, and it appears to be less of a problem than many retailers anticipate We also find some support for the H_{6a} proposition that retailers can benefit from lead supplier CM influence beyond the benefits that accrue through greater CM intensity, with a coefficient of 139 ($p < 05$) in the retailer category performance model However, the insignificant coefficient in the objective financial growth model indicates that this benefit may apply to objectives other than those related to financial growth Our results also indicate strong support for H_{6b}, which links lead supplier influence on retailers' CM directly to the lead supplier's performance, with path coefficients of 396 and 401 (both $p < 001$) in the two models

From a downside risk and cost perspective, in contrast to Morgan, Kaleka, and Gooner (2007), we find no evidence in either SEM that a lead supplier's influence on retail CM is related to its opportunism (R1) This may be a result of differences in the U S and U K contexts For example, the U K market is dominated by a small number of powerful retailers that keep CM largely in-house and view exercising their power to gain price leverage over suppliers as the normal "rules of the game " As a result, U K suppliers may have a greater incentive to exploit any influence they have Alternatively, the different results may be a result of including CM intensity in our comprehensive CM model, which provides lead suppliers with a greater performance benefit from working with rather than against the retailer's interests

Consistent with Morgan, Kaleka, and Gooner (2007), our SEM results show that when opportunism emerges, it can both damage the retailer's category performance directly (R2) and incite militant behaviors by other suppliers (R3) However, also consistent with Morgan, Kaleka, and Gooner, the absence of a significant, negative militancy–retailer performance relationship (R4) in either of our models suggests that nonlead suppliers have limited "punitive capacity " We find no support for H_{6c}, which links lead supplier influence with increased militancy by other suppliers We find some support for the hypothesized negative relationship between lead supplier opportunism and lead supplier performance (H_7) with a significant negative coefficient of – 143 ($p < 05$) in the meeting retailer category goals model Finally, both SEM models support H_8, which links lead supplier category performance with retailer category performance, with path coefficients of 181 ($p < 001$) and 161 ($p < 05$), respectively

Discussion of SEM Results

These results offer important new insights into the benefits of retail CM First, more intensive CM efforts bring performance benefits to both the retailer and lead supplier In addition, with a significant, negative relationship with militancy by other suppliers, our study suggests that this can occur in ways that may also be appreciated by the other suppliers to a category From a simple "more effort delivers more results" perspective, these results may appear intuitive for the retailer, however, they contrast with the widespread skepticism regarding claims of CM benefits among retailers in our fieldwork and in the trade press In addition, the finding that *both* retailers and suppliers (including those who may have little or no influence on retail CM) claim these CM value-creation benefits contradicts prior analytical work suggesting that retailers will claim all of any CM benefits (e g , Basuroy, Mantrala, and Walters 2001, Gajanan, Basuroy, and Beldona 2007) Second, our results show that lead supplier influence on retailer CM also brings positive benefits for both the lead supplier and the retailer—beyond those that accrue to both parties through driving greater CM intensity In addition, the evidence we present of some direct benefits of lead supplier influence to retailer category performance suggests that even when retailers have and deploy needed CM resources to intensively manage a category, the quality of CM may be enhanced by involving lead suppliers

Our SEM results also offer important new insights concerning when greater retail CM intensity is most likely First, consistent with GVA, we find that when retailers' in-house CM resources are inferior, they seek help from a lead supplier by ceding influence over their CM decisions However, when retailers possess superior CM resources, we find that they are not using them to engage in more intensive CM Given the CM performance benefits we show, this is a missed opportunity for some of the retailers in our sample Conversely, we find that while retailers with greater marketing capabilities engage in more intensive CM, the absence of these capabilities does not appear to motivate retailers to seek CM support from an influential lead supplier Thus, while more capable retailers are engaging in more intensive CM, many retailers with their own CM resources apparently allow their fears of relying on a lead supplier to blind them to an important opportunity to enhance their CM efforts and forgo CM's benefits as a result

Second, we find that more retail CM occurs in categories that are strategically important to the retailer At one level, this is intuitive Retailers should allocate scarce CM resources wherever they can most contribute to achieving their strategic objectives Likewise, lead suppliers that want to maximize their retail CM influence will allocate their own resources to the retailer categories that will give them the greatest influence However, both core competence (e g , Hamel and Prahalad 1994) and positioning (e g , Porter 1996) strategic logic suggest that retailers should keep direct control over activities that are central to their long-term competitive advantage In addition, GVA supports these arguments but, importantly, also posits that firms can allow external control of strategically important activities if the value creation and claiming benefits of doing so can be protected by an appropriate governance mechanism (e g , Ghosh and John 1999, 2005) That the retailers in our sample generally allow a lead supplier more CM influence in the retailer's most strategically important categories in exchange for access to the resources necessary to create value through CM indicates that, despite the skepticism and fears voiced in the literature and our fieldwork, retailers believe that CM is such a governance mechanism

Finally, from a downside risk and costs perspective, our SEM results clearly show that retailer fears regarding retail CM are overblown Opportunism by lead suppliers does exist in our sample, and when it does, it damages the retailer's and lead supplier's performance However, we show that opportunism is no more likely to occur in categories under retail CM Moreover, we also show that retail CM is likely to reduce rather than incite militant behaviors by other suppliers Collectively, these results indicate that retail CM is an effective value-creating and claiming mechanism in which retailer–lead supplier CM relationships can be win-win—and that this can be accomplished without sacrificing the retailer's relationships with its other suppliers However, if judged by their CM actions, it is apparent that to some of the retailers in our sample, these conclusions are either not obvious or not believed To provide greater insight into this, we now turn to a follow-up descriptive analysis

Profile of Category Captain Conditions and Outcomes

Table 5 presents means and standard deviations for all of the variables in our Figure 1 model of retail CM for the total sample as well as for situations in which the retailer has elected to use a category captain and those in which the lead supplier is not a category captain Note that in our sample, which is representative of a large number of categories and supermarket chains, half the retail CM situations we examine involve reliance on a category captain Next, we briefly profile the characteristics of these retail CM situations in which a category captain is used

Table 5 confirms that category captains enjoy dramatically higher (5 47 vs 2 66) mean CM influence than suppliers in traditional roles, and on average the categories they support are managed much more intensively (means of 4 77 vs 4 03) This indicates that the category captain measure converges with our retail CM conceptualization and its key measures

On average, retail CM settings managed by category captains are more strategically important to retailers (4 74 vs 4 10) than those managed without a captain, and retailers acknowledge that these are categories in which they on average have lower relative resources (2 79 vs 4 63) and marketing capabilities (4 87 vs 5 14) Retailers report that the mean level of opportunism is relatively low for both category captains and other lead suppliers—and importantly, the difference (2 45 vs 2 54) does not approach statistical significance ($p <$ 517) Despite the similar mean levels of opportunism by category captains and other lead suppliers, retailers report that militancy by other suppliers is on average significantly lower with category captains (3 33 vs 3 88) However, an even greater benefit highlighted in this analysis is that category captains are associated with

TABLE 5
Descriptive and ANOVA Statistics for Total Sample and Subgroups of those Retailers Using or Not Using a Category Captain

Construct	Total Sample (n = 347) M (SD)	Category Captain (n = 174) M (SD)	No Category Captain (n = 173) M (SD)	F (*p*-Value) d.f. = 1,346
Lead supplier influence	4 07 (1 82)	5 47 (1 04)	2 66 (1 26)	513 84 (*p* < 001)
CM intensity	4 40 (1 21)	4 77 (96)	4 03 (1 32)	35 78 (*p* < 001)
Retailer relative resources	3 71 (1 85)	2 79 (1 61)	4 63 (1 61)	113 68 (*p* < 001)
Retailer marketing capabilities	5 20 (99)	4 87 (99)	5 14 (1 13)	5 65 (*p* < 018)
Category strategic importance	4 42 (1 55)	4 74 (1 36)	4 10 (1 67)	15 41 (*p* < 001)
Lead supplier opportunism	2 50 (1 30)	2 45 (1 17)	2 54 (1 42)	421 (*p* < 517)
Militancy by other suppliers	3 60 (1 34)	3 33 (1 38)	3 88 (1 24)	14 94 (*p* < 001)
Lead supplier category performance	4 63 (75)	4 86 (66)	4 40 (76)	37 13 (*p* < 001)
Meeting retailer category goals	4 60 (1 30)	5 05 (92)	4 15 (1 47)	47 13 (*p* < 001)
Objective financial growth	1 47 (2 67)	1 97 (2 95)	1 02 (2 31)	7 41 (*p* < 007)

much higher average performance for the retailer in meeting its category objectives (5 05 vs 4 15) and achieving financial growth (1 97 vs 1 02) Category captains clearly do not produce this result by trading off their own well-being for the benefit of the retailer To the contrary, category captain mean performance gains are on average higher (4 86 vs 4 40) while achieving higher performance for their retail partners These descriptive results are consistent with the estimates produced by the SEM analysis, but the magnitude of the advantage of using a category captain is even clearer, suggesting that no retailer or supplier should ignore the potential value of such collaborations

These results offer new insights into the use of category captains The incidence of category captain relationships we observe is more common than is widely believed among industry analysts (Both retailers and suppliers have been reticent to provide estimates of the extent of the use of category captains) When retailers enter into such category captain relationships with a lead supplier, our findings suggest that the beneficial effects of retail CM for both retailers and suppliers may be even greater than those revealed in our SEM results Category captain situations exhibit significantly higher levels of both CM intensity and lead supplier influence on retail CM and significantly higher mean category performance outcomes for both retailers and lead suppliers In addition, the downside risks and costs of CM may be even lower when the lead supplier to the category is a category captain—with similarly low levels of opportunism and significantly lower levels of militant behaviors by other suppliers when using category captains Overall, this suggests that retailers' outsourcing of CM to category captain lead suppliers offers a viable way to enhance channel system efficiency However, as we observe here, only half our sample of retail CM situations is retailers benefiting from such arrangements

Implications for Theory

Our study offers contributions to theory in three main areas First, we develop and test a comprehensive new model of retail CM Our model reveals the importance of the intensity of CM efforts in a category in understanding retail CM Most prior work has adopted an analytical perspective and viewed CM as a binary variable (i e , does the retailer "do" CM or not? e g , Gajanan, Basuroy, and Beldona 2007) We show that this framing is unrealistic and may therefore potentially produce misleading insights Both our fieldwork and empirical results indicate that retailers' CM resources are scarce Retailers must therefore make strategic resource allocations regarding how intensively to manage each of the categories that they sell Therefore, it is unlikely—if not impossible—for any retailer selling 300-plus product categories to simply make and execute a policy decision to manage all its categories intensively We also observe a wide range of different CM intensity values across the 347 CM situations for which we have data—with less than 10% of these categories being managed at either extremely low or extremely high intensity (2 or less or 6 or more on a seven-point scale) Thus, we show that CM intensity is rarely an "all or nothing" decision at either the retailer or the category level This suggests the need for finer-grained analytical CM models that allow for different levels of CM intensity rather than simply the existence (or nonexistence) of retail CM

In addition, the research streams considering CM and buyer–seller relationships have developed independently of one another Our model offers the first integration of these research streams, considering both the level of CM activities (CM intensity) and who performs them (lead supplier influence) We show that both aspects of retail CM need to be examined simultaneously, because studying either component in isolation presents an incomplete picture of retail CM and produces potentially erroneous conclusions For example, our SEM results indicate that focusing on either lead supplier influence or CM intensity would significantly understate the benefits of retail CM to both retailers and lead suppliers Similarly, ignoring lead supplier influence's effect on retail CM would miss its critical role in driving CM intensity in our results, while focusing only on lead supplier influence would miss other suppliers' reduction in militancy associated with more intensive CM efforts Thus, we show that any comprehensive model capable of explaining when retail CM occurs and its costs and benefits must include both of these components Our data—representing a wide variety of product categories sold by U S supermarket retailers—provide strong support for our model Our empirical results are specific to the U S supermarket channel, but our theorizing has wider applications to other markets in which retailers and wholesalers sell multiple brands from multiple suppliers

Second, we offer new insights into the mechanisms by which retail CM adds value in a network supply-chain context For example, we find that relying on a lead supplier in retail CM leads to improved performance for the retailer and the lead supplier, without provoking greater levels of push-back from other suppliers Furthermore, the greater CM intensity produced by relying on lead suppliers actually reduces other suppliers' militancy These outcomes may be even stronger when the lead supplier is a designated category captain Overall, this supports the idea that dyadic buyer–supplier relationships can affect the rest of the supply network (e g , Anderson, Håkansson, and Johanson 1994) Indeed, in retail CM and other analogous settings (e g , vendor-managed inventory, outsourcing of R&D to "first-tier" parts suppliers), the dyadic buyer–lead supplier relationship is designed to create such network effects However, in the face of supply network interdependencies, such buyer–seller relationships can clearly give rise to costs as well as benefits In our U S supermarket context, we do not observe significant lead supplier opportunism and other supplier militancy risks and costs However, in other situations in which nonlead suppliers are less dependent on a small number of large buyers and/or have a higher punitive capacity, such network costs might outweigh CM's benefits

Third, we provide new insights relevant to the emerging GVA perspective on interorganizational relationships and marketing strategy that incorporates firm-specific resource differences (e g Ghosh and John 1999, 2005, Palmatier, Dant, and Grewal 2007) Importantly, despite the potential for conflicting goals and power-dependency issues, our results show that sharing of needed resources can be accomplished in ways that result in true win-win relationships between buyers and suppliers—even in a context that our fieldwork revealed uses no formal contracts to safeguard the ability to claim value from their joint efforts Thus, consistent with GVA, appropriately designed and managed buyer–seller coordination is clearly a viable relational mechanism to expand resource availability, enable new value-creating strategies to be conceived and executed, and allow the outcomes to be jointly claimed by both parties This has important implications For example, it suggests that channel research using analytical models should allow for win-win relationships such as those we observe, rather than focusing only on zero-sum games (e g , Basuroy, Mantrala, and Walters 2001, Gajanan, Basuroy, and Beldona 2007)

Implications for Managers and Policy Makers

Our study offers several important new insights for managers First, in the absence of credible evidence of CM benefits, many retailers have undermanaged the product categories they sell We show that retailers engage with lead suppliers when facing deficits in needed CM resources and ramp up their CM intensity and category performance as a result However, we also show that when retailers possess the needed CM resources in-house, they are not using these resources to increase the intensity of their CM efforts This is short-sighted Contrary to the skepticism uncovered in our fieldwork, we show that more intensive retail CM has performance benefits for both retailers and suppliers The fact that we find these benefits in a sample of 35 categories, across a large proportion of the U S supermarket population, enhances confidence in the generalizability of this relationship It also suggests that retailers can benefit from CM across a wider range of the product categories they sell than has been previously believed Thus, retailers should prioritize both the *development* and *deployment* of resources needed for effective CM In doing so, our results suggest that the development of in-house retailer marketing capabilities should clearly be a priority

Second, our results indicate that retailers should actively seek to use effective suppliers to serve as category captains to more intensively manage the product categories they sell and to improve category performance We show that retailers and influential lead suppliers can collaborate in retail CM in a win-win manner and that retailer fears concerning the downside risks and costs associated with allowing a supplier to have significant CM influence are overblown The CM benefits we uncover for lead suppliers also suggest that producers should be open to overtures from retailers and should also initiate category captain relationships A supplier that can document success in CM relationships with other retailers, especially in noncompeting markets, will likely have an advantage in this effort

Third, although we find that an influential lead supplier is no more likely to be opportunistic and that average levels of opportunism are low, some opportunism does still exist Our results show that this opportunism damages the lead supplier's as well as the retailer's performance and also provokes other suppliers' militant behaviors Thus, retailers should continue to be vigilant in their monitoring—particularly when they do not use a category captain—and should encourage all suppliers to report such opportunism when they see it Supplier managers should also note that retailers are readily able to detect and punish opportunism and that the performance benefits of being influential in retailers' CM in the U S supermarket supply chain offer rewards that make any short-term benefits of opportunism look even less attractive

Finally, our findings on retailers' use of category captains in retail CM are also of interest to public policy makers Antitrust analysts have discussed the potential for a category captain to either unfairly disadvantage competing suppliers to a product category or to collude with them (e g , Desrochers, Gundlach, and Foer 2003, Steiner 2001) Category captains are the norm in some CM situations, and they directly affect the marketing of rivals' products They are potentially able to restrict competition and thereby damage consumer welfare Our findings of decreased militancy by other suppliers when retailers use designated category captains suggest that some force—competition limiting power, collusion, or a combination—is at work However, the increased efficiency and effectiveness in meeting consumer needs suggested by improvements in retailer and category captain category performance—apparently not at the expense of other suppliers—may be an equally important consideration from a social welfare perspective

Limitations and Research Directions

There are several limitations in our study First, much of the data was collected at the same time, thus limiting our ability to evaluate causality However, we based the ordering of relationships tested on insights generated in our fieldwork, and it is supported in the literature Moreover, by collecting financial growth data a year later for a large subset of our sample, we were able to confirm the retail CM–performance relationships Nonetheless, further research utilizing longitudinal research designs may be useful in confirming the causal ordering of the other relationships uncovered in our research For example, time-series analysis of category-level scanner data before and after the introduction of a CM system could evaluate the performance effects on the retailer, lead supplier, and other suppliers Second, although we sampled 35 representative product categories, other categories that are defined by different retailers in more idiosyncratic ways may be handled differently Thus, care should be applied in generalizing our results to other categories In addition, in the interest of generalizing our findings across a broad range of categories, this research uses a cross-category and cross-retailer design Further research examining individual categories and retailers may provide a richer understanding of the contingencies associated with category performance

Our findings suggest several additional areas for further research First, in this initial research, we focus on linking the deployment of resources in retail CM with performance outcomes for retailers and suppliers However, we do not explicitly distinguish which party's resources are actually being deployed in the retailer's CM. Does it matter whether it is primarily the retailer's, the lead supplier's, or other suppliers' resources—and if more than one of these, in what combination? This is a promising line of inquiry for theoretically interesting and managerially relevant CM research.

Second, although we adopt a retailer perspective, our findings of lead supplier benefits suggest that a key question for further research is the cost to a supplier of supporting—or even taking over—retailers' CM. In addition, our interviews suggest that suppliers increasingly view jockeying for the category captain position as the basis of intersupplier competition. This raises important new questions. For example, what resources and strategies are required to compete effectively to be a category captain? Furthermore, given supplier consolidation and the network nature of the supply chain, what is the impact of multicategory and multiretailer competition on supplier strategies and performance? For example, category captains and other suppliers may consciously or unconsciously share in the value created in retail CM. Is this a result of tacit agreements with other suppliers not to exclude them from CM benefits because of multipoint contacts in which rival CPG suppliers act as category captain for the same category for different retailers and/or as category captain on different categories for the same retailer?

Finally, given the public policy concerns surrounding the impact of retail CM on competition and consumer welfare, retailer–supplier CM relationships are clearly an area in which further research is required. For example, researchers should examine the impact of using category captains on the wholesale prices of both the lead and other suppliers' brands—and the subsequent retail prices charged to consumers. In addition, as highlighted previously, there is multipoint contact among suppliers in this channel and likely lead/nonlead supplier role reversals when most CPG firms sell across multiple categories and all sell to multiple retailers. It is therefore important to examine whether and how such multipoint contact among suppliers may reduce channel competition and efficiency and how it affects wholesale prices.

Conclusion

Despite skepticism among managers, we show that positive performance outcomes can be realized by both a retailer and a category captain when a retailer's product categories are more intensively managed and a category captain has significant influence over the management of all the brands in the category. We also show that many of the feared downside costs and risks associated with retail CM are overblown and are outweighed by the benefits for retailers and suppliers that serve as category captain. Our study provides the first evidence that retail CM is an effective value-creating and value-claiming mechanism in which retailer–supplier relationships can be win-win. However, even when they have the needed resources in-house, we find that many retailers are undermanaging the product categories they sell. Apparently, they do not want to cede control to an influential lead supplier but then do not take steps to increase CM intensity and category performance unilaterally. We show that this is shortsighted and leads to suboptimal performance.

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Corine S. Noordhoff, Kyriakos Kyriakopoulos, Christine Moorman,
Pieter Pauwels, & Benedict G.C. Dellaert

The Bright Side and Dark Side of Embedded Ties in Business-to-Business Innovation

Although the number and importance of joint innovation projects between suppliers and their customers continue to rise, the literature has yet to resolve a key question Do embedded ties with customers help or hurt supplier innovation? Drawing on both the tie strength and knowledge literatures, the authors theorize that embedded ties interact with supplier and customer innovation knowledge to influence supplier innovation In a sample of 157 Dutch business-to-business innovation relationships, they observe that embedded ties weaken how much suppliers benefit from customer innovation knowledge because of worries about customer opportunism (the dark side of embedded ties) However, they uncover three moderating relationship and governance features that allow suppliers to overcome these dark-side effects and even increase innovation (the bright side of embedded ties) Finally, although the authors predicted a bright-side effect, they find that embedded ties neither help nor hinder the supplier to leverage its own innovation knowledge in the relationship

Keywords embedded ties, knowledge, business-to-business partnerships, innovation, co-creation, dark side, bright side

To reduce costs and increase the effectiveness of innovation efforts, many business-to-business (B2B) firms now engage in joint innovation activities with customers (Anderson, Håkansson, and Johanson 1994, Fang 2008, Von Hippel and Katz 2002) At both the dyadic (e g , Moller and Halinen 1999) and network (e g , Achrol and Kotler 1999) levels, there is a sizeable literature on joint innovation activities (Ahuja 2000, Lane and Lubatkin 1998, Powell, Koput, and Smith-Doerr 1996, Rindfleisch and Moorman 2001, Sivadas and Dwyer 2000) The focus of this literature is to understand the conditions under which these complex activities produce innovation Studies have examined governance choices (Carson 2007, Sividas and Dwyer 2000), partner selection and management (Bonner and Walker 2004, Cavusgil, Calantone, and Zhao 2003), network design and management (Ahuja 2000, Wuyts, Stremersch, and Dutta 2004), and interorganizational learning (Rindfleisch and Moorman 2001, Uzzi and Lancaster 2003)

Our focus is on the knowledge exchange occurring in vertical (supplier–customer) interfirm innovation relationships Such exchange is central to innovation because although supplier firms have the knowledge to produce a solution, customer firms have the most knowledge about their own needs as users (Von Hippel 1986) Thus, if the two partners can exchange what they know, the likelihood of supplier innovation increases However, this outcome is not a given, as witnessed in the dismal 70% failure rate of B2B innovation alliances (see De Rond 2003, p 3, Hughes and Weiss 2007, Lhuillery and Pfister 2009)

One challenge is that knowledge exchange activities take place in the context of relational attachments between firms (e g , Lane and Lubatkin 1998, Uzzi 1997) Previous literature has studied the role of trust (Grayson and Ambler 1999, Moller and Halinen 1999, Moorman, Zaltman, and Deshpandé 1992) and embedded ties (e g , Rindfleisch and Moorman 2001, Selnes and Sallis 2003, Uzzi and Lancaster 2003) on knowledge exchange between firms

We focus on one unresolved issue related to these relationships the controversial role of embedded ties as both a bright-side and dark-side influence on supplier innovation (see Mohr and Sengupta 2002) The bright-side view posits that embedded ties facilitate the transfer of complex, sensitive, and even tacit knowledge between partners (Hansen 1999, Reagans and McEvily 2003) as commitment and trust

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lower fears of opportunism (Rindfleisch and Moorman 2001) In turn, knowledge transfer between partners increases the likelihood of innovation

A contrasting dark-side view argues that embedded ties can have a negative effect on knowledge sharing for innovation This occurs because embedded partners converge in their thinking (Anderson and Jap 2005, Moorman, Zaltman, and Deshpandé 1992), fail to switch to new partners when they would offer new knowledge (Gu, Hung, and Tse 2008, Sorenson and Waguespack 2006), and have increased opportunities to use exchanged knowledge to their partners' detriment (Anderson and Jap 2005, Grayson and Ambler 1999, Selnes and Sallis 2003)

We seek to reconcile these views by arguing that whether embedded ties produce a bright-side or dark-side effect depends on other conditions in the relationship Following work on knowledge flows in dyadic exchange behavior (Frenzen and Nakamoto 1993, Selnes and Sallis 2003), we offer a contingency view of the effect of embedded ties as it interacts with supplier and customer innovation knowledge We do this in three ways

First, we theorize that embedded ties with a customer help a supplier leverage its own knowledge more effectively We argue that this occurs because close customer ties increase supplier motivation to use its knowledge Close ties also increase supplier opportunity to test its knowledge against customer experience early in the innovation process In this bright-side effect, embedded ties interact with supplier innovation knowledge to increase supplier innovation Second, we theorize that when the supplier is in an embedded relationship with a highly knowledgeable customer, this produces the two dark-side outcomes found in prior research—increased supplier worries about customer opportunism and supplier perceptions of knowledge redundancy These, in turn, reduce supplier innovation Thus, we predict that the dark side is caused by the interaction of embedded ties and customer innovation knowledge Third, we theorize that this dark side can transform into a bright side when the partners agree to a set of relational and governance mechanisms We theorize that this occurs because these mechanisms reduce supplier worries about customer opportunism and perceptions of knowledge redundancy

We test our ideas in a sample of B2B relationships involved in innovation projects across Dutch manufacturing industries All relationships are vertical between a supplier (the firm seeking to innovate) and a business customer (the firm the supplier has partnered with to innovate) Our focus is on supplier innovation, defined as the supplier's use of new or improved product, service, or process activities relative to the supplier's current activities (Thompson 1965, Zaltman, Duncan, and Holbek 1973) This broadened view of innovation allows the firm to innovate in all areas of marketing, not just new products and services For example, a supplier might sell current products but introduce a new segmentation scheme or a new channel

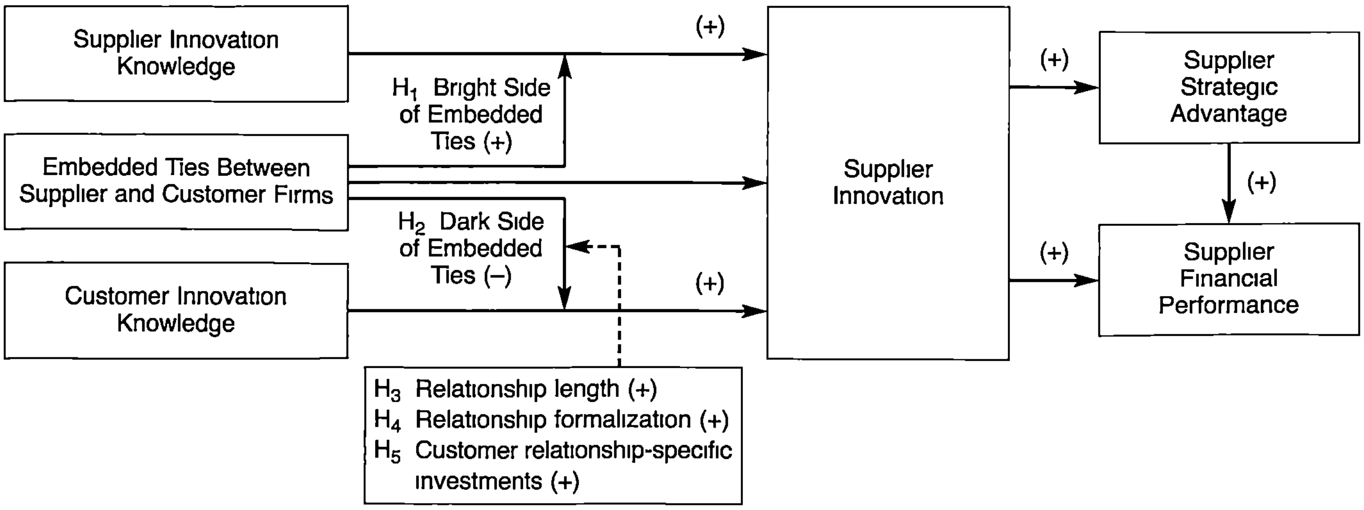
Theory

We begin with an overview of the literature on tie strength and partner knowledge in innovation We then make predictions about (1) how embedded ties interact with supplier knowledge to increase supplier innovation, (2) how embedded ties interact with customer knowledge to decrease supplier innovation, and (3) three relational and governance conditions that turn this dark side into a bright side Figure 1 summarizes our predictions

The Conflicting Effects of Embedded Ties on Innovation

The tie-strength literature has examined the nature and effect of relationships in general (Granovetter 1973), in intraorganizational settings (Levin and Cross 2004), in interfirm relationships (Rindfleisch and Moorman 2001, Uzzi 1997), and in networks (Ahuja 2000), both in marketing and in strategy This research focuses on the role of relational embeddedness between partners Following Uzzi and

FIGURE 1
The Role of Embedded Ties in B2B Innovation: The Dark Side and the Bright Side


Supplier Innovation Knowledge
Embedded Ties Between Supplier and Customer Firms
Customer Innovation Knowledge
H1 Bright Side of Embedded Ties (+)
H2 Dark Side of Embedded Ties (–)
(+)
(+)
Supplier Innovation
(+)
(+)
(+)
Supplier Strategic Advantage
Supplier Financial Performance
H3 Relationship length (+)
H4 Relationship formalization (+)
H5 Customer relationship-specific investments (+)

Lancaster (2003), we define embedded ties as a close and reciprocal relationship between a customer firm and a supplier firm

Embedded ties improve a wide range of relational and business performance outcomes [1] However, research on the effect of embedded ties in the context of novel outcomes (e g , innovation) has uncovered conflicting results Early classic work has demonstrated that people find new jobs through weak or distant relationships This is because weak ties provide novel information compared with strong ties, which recycle familiar information (Granovetter 1973) Consistent with this finding, follow-up research has shown that weak ties offer firms nonredundant information in intraorganizational settings (Levin and Cross 2004) and across firms in a network (Ahuja 2000) Other research, however, has found that strong or embedded ties facilitate access to novel information in interfirm settings (Hansen 1999, Uzzi and Lancaster 2003) One explanation is that partners involved in embedded ties are more willing to exchange sensitive or private knowledge because they trust each other (Reagans and McEvily 2003, Rindfleisch and Moorman 2001, Uzzi and Lancaster 2003)

These findings have generated insights into the role of embedded ties However, given their conflicting nature, the extent to which firms can build innovation strategies using these ideas is limited Furthermore, from a theoretical viewpoint, the observed conflicts in previous research indicate that other factors may influence when embedded ties have a positive or negative effect Therefore, we investigate the conditions under which embedded ties help or hurt supplier innovation Given the aforementioned critical role of knowledge exchange in interfirm innovation relationships (Carson 2007, Powell, Koput, and Smith-Doerr 1996, Rindfleisch and Moorman 2001, Selnes and Sallis 2003, Sivadas and Dwyer 2000), we focus our attention on the interaction of embedded ties and both customer and supplier knowledge

The next section briefly defines innovation knowledge, which is our focus, and describes the impact of customer and supplier innovation knowledge on supplier innovation We then turn to our predictions about the interaction of innovation knowledge and embedded ties

The Impact of Supplier and Customer Innovation Knowledge on Supplier Innovation

The role of knowledge has a long and influential history in the innovation literature in general (e g , De Luca and Atuahene-Gima 2007, Han, Kim, and Srivastava 1998, Henard and Szymanski 2001, Moorman 1995) and in the interfirm innovation literature specifically (Carson 2007, Powell, Koput, and Smith-Doerr 1996, Rindfleisch and Moorman 2001, Sivadas and Dwyer 2000) Following Moorman and Miner (1997, p 93, see also Day 1994), we define firm knowledge as "stored beliefs, behavioral routines, or physical artifacts that vary in their content, level, dispersion, and accessibility " We focus on innovation knowledge because it is a key factor in the innovation partnerships we study (Dyer and Nobeoka 2000, Lilien et al 2002, Sivadas and Dwyer 2000) We investigate two types of partner innovation knowledge supplier innovation knowledge and customer innovation knowledge

First, supplier innovation knowledge should influence supplier innovation levels (e g , Henard and Szymanski 2001) We focus on the supplier's proactive market orientation as a key type of supplier innovation knowledge Narver, Slater, and MacLachlan (2004) define proactive market-oriented firms as exhibiting two features relevant to innovation (1) a set of values associated with risk tolerance and entrepreneurship (Hamel 1991, Slater and Narver 1995) and (2) market information processes to uncover and meet latent, unarticulated customer needs Both qualities have been linked to firm innovation (e g , Atuahene-Gima and Ko 2001, Chandy and Tellis 1998, Narver, Slater, and MacLachlan 2004) Chandy and Tellis (1998, p 479) argue that a focus on customer needs of the future makes decision makers "aware of the market-related developments and the potential effects on the firm " Thus, firms are not overly committed to current marketing-related activities and actively screen for new ways of doing things In a similar vein, Narver, Slater, and MacLachlan (2004) emphasize that innovation knowledge drives the development and implementation of novel activities that address latent customer needs

Second, following the literature, we define customer innovation knowledge as reflected in two key lead-user abilities (1) identifying needs and solutions sooner than most customers (Lilien et al 2002) and (2) applying existing solutions in novel ways (Urban and Von Hippel 1988) [2] Both abilities play an important role in innovation outcomes (Brown and Eisenhardt 1997, Morrison, Roberts, and Von Hippel 2000, Urban and Von Hippel 1988) Because innovation is an uncertain process lacking reliable information about latent needs, suppliers can benefit from customer innovation knowledge to generate novel ideas early in the process (Bonner and Walker 2004, Lilien et al 2002) Therefore, when engaged in joint innovation with a high innovation knowledge customer, the likelihood of supplier innovation should increase [3]

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[1] Research has studied the impact of embedded ties on customer value (Palmatier 2008), cooperation (Morgan and Hunt 1994), trust (Levin and Cross 2004), expectations of continuity (Morgan and Hunt 1994, Palmatier et al 2006), exchange of information (Hansen 1999, Reagans and McEvily 2003, Stanko, Bonner, and Calantone 2007, Uzzi and Lancaster 2003), and business performance (Rowley, Behrens, and Krackhardt 2000, Uzzi 1997)

[2] Urban and Von Hippel (1988) point out that lead-user customers also have stronger needs than typical customers This state is a likely reason that lead users are more motivated to solve needs on their own rather than waiting for solutions from the market We do not include this quality of lead users in our description of customer innovation knowledge, because it is more a motivational state arising from knowledge and not a quality of knowledge itself

[3] We do not offer main-effect hypotheses for the effects of the two types of partner innovation knowledge on supplier innovation given their more straightforward effect in the literature Instead, we focus on how supplier innovation knowledge and customer innovation knowledge interact with embedded ties as predicted in H_1 and H_2

Our discussion thus far focuses on the main effects of embedded ties and supplier and customer innovation knowledge on the supplier's innovation prospects As shown in Figure 1, we now focus our attention on how these components interact to give rise to the bright and dark side of embedded ties documented in the literature

The Bright Side: Embedded Ties Strengthen the Impact of Supplier Innovation Knowledge

We begin by proposing that embedded ties with a customer can help a supplier leverage its own knowledge more effectively We offer two mechanisms for this bright-side effect the motivation and opportunity to leverage supplier innovation knowledge

An embedded relationship with a customer motivates the supplier to use its own market knowledge to develop innovations that meet the customer's needs (Dyer and Nobeoka 2000, Rowley, Behrens, and Krackhardt 2000) Specifically, an embedded relationship with the customer may prompt a supplier to work harder to use its own knowledge to address unmet customer needs (Cavusgil, Calantone, and Zhao 2003) In the absence of embedded ties, the supplier may instead slip back into established technologies or routines (Day 1994) Furthermore, when supplier innovation knowledge is low, there will be less knowledge to leverage Therefore, both supplier innovation knowledge and embedded ties are essential to this effect

An embedded relationship with the customer also gives the supplier an opportunity to test its ideas early in the innovation process This allows the supplier to get an early understanding of what does and does not work to improve innovations If supplier innovation knowledge is low, there will be less need for this opportunity Moreover, if the supplier does not have a strong bond with the customer, it may not be willing to risk exposing underdeveloped ideas As an example, Danfoss A/S, a $4 5 billion Danish company in the research and development (R&D) and production of control technology for the water treatment industry, engaged in months of new product testing in the production environment of several of its customers' plants, which posed the risk of affecting local water supplies Danfoss's close relationship with these lead-user customers allowed it to use this early learning strategy (Buur and Matthews 2008) Therefore, both supplier innovation knowledge and embedded ties are important We predict the following

H_1 Embedded ties between a supplier and customer strengthen the positive effect of supplier innovation knowledge on supplier innovation

The Dark Side: Embedded Ties Weaken the Impact of Customer Innovation Knowledge

One reason suppliers form a relationship with a knowledgeable customer is to improve innovation prospects However, as ties become embedded, the supplier faces a set of risks associated with working with a knowledgeable customer Specifically, when ties are strong *and* customers are knowledgeable, two potential problems are likely to occur increased worries of partner opportunism and increased perceptions of knowledge redundancy

Previous researchers have extensively studied the first mechanism, opportunism, in marketing relationships (e g , Jap 2003, Wathne and Heide 2000) We use Williamson's (1975, p 6) definition of opportunism as "self-interest seeking with guile" and focus on the harm that a customer can inflict on a supplier Research has acknowledged that embedded partners have an increased opportunity to take advantage of one another Granovetter (1985, p 491) describes this risk as an "enhanced opportunity for malfeasance" and notes that "a person's trust in you results in a position far more vulnerable than that of a stranger" Selnes and Sallis (2003, p 80) refer to this problem as the "hidden costs of trust," and they observe a negative interaction between trust and knowledge exchange activities on relationship performance

We argue that as embeddedness increases, the risk of opportunism weakens the effect of customer innovation knowledge on supplier innovation A key risk that suppliers perceive is that customers will use supplier information to vertically integrate backward and compete directly with the supplier Mohr and Sengupta (2002) refer to this as the risk that the customer will "internalize" supplier information and compete against the supplier[4] As a supplier becomes increasingly concerned about a customer using supplier information in this way (Jap 2003), suppliers begin to withhold sensitive information In turn, this provokes similar and reciprocal responses from the customer When this happens, the supplier is less able to obtain and less likely to use customer innovation knowledge to bolster its own innovation This risk is much lower when the customer has low innovation knowledge because the customer has less to give and is less likely to innovate on its own (Frazier et al 2009) Furthermore, in nonembedded relationships, these concerns do not arise because suppliers and customers share less confidential information with one another Therefore, we argue that the opportunity for malfeasance is higher when ties are embedded and customers are knowledgeable

A second reason embedded relationships weaken the effect of customer innovation knowledge on supplier innovation is the tendency for partners in embedded relationships to have redundant knowledge (Anderson and Jap 2005, Grayson and Ambler 1999, Selnes and Sallis 2003) We follow Rindfleisch and Moorman (2001, p 3) and define redundant knowledge as the degree of similarity in partner knowledge, capabilities, and skills As embeddedness increases, suppliers obtain more innovation knowledge from customers and use it to focus products and marketing actions on customer needs (Dyer and Nobeoka 2000, Rowley, Behrens, and Krackhardt 2000) When this occurs, suppliers tend to assume they know much of what the customer can share with them As Moorman, Zaltman, and Deshpandé (1992, p 323) describe, partners come to view each other as "stale or too similar to them in their thinking and therefore have less value to add" As a result, the supplier is less likely to seek and/or receive customer innovation knowledge. This reduces the effect of customer innovation knowledge on supplier innovation. These problems do not arise when the customer has low innovation knowledge or the relationship is weak, because suppliers do not seek as much information from less knowledgeable customers. Likewise, in nonembedded relationships, customers will share less information with suppliers. Thus, the opportunity for redundant knowledge occurs only when ties are embedded and customers are knowledgeable.

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[4] This risk is similar to the opportunism worries that firms in horizontal new product alliances face, given that competitors can commercialize ideas and reap innovation benefits (Rindfleisch and Moorman 2001)

In summary, we hypothesize that embedded ties weaken the positive effect of customer innovation knowledge on supplier innovation and that the responsible mechanisms are partner opportunism and perceived knowledge redundancy. We predict the following:

> H_2: Embedded ties between a supplier and customer weaken the positive effect of customer innovation knowledge on supplier innovation.

The Bright Side: When Embedded Ties Strengthen the Impact of Customer Innovation Knowledge

Our second prediction focused on how embedded ties weaken a supplier's ability to leverage its customer's innovation knowledge. We now investigate three solutions that can attenuate this problem and convert the dark-side effect predicted in H_2 into a bright-side effect. First, given the importance of relationship length in the interorganizational literature (e.g., Dwyer, Schurr, and Oh 1987; Jap and Anderson 2007), we consider whether it may be a potential antidote to the dark-side effects. Second, we examine two formal governance mechanisms—relationship formalization and customer relationship-specific investments—that offer safeguards against the predicted dark-side effects. We consider how each of these three factors reduces suspicions of customer opportunism and perceptions of customer knowledge redundancy (the two mechanisms creating the proposed dark-side effects in H_2).

We begin with relationship length, defined as the amount of time the supplier and customer firms have been in a relationship. Research on interfirm relationships offers conflicting ideas about the effect of length. Some researchers have argued that relationships evolve through a predictable cycle from awareness to exploration, expansion, and commitment and ultimately to dissolution, with trust increasing and then decreasing (Dwyer, Schurr, and Oh 1987). Other researchers have shown that a close relationship can emerge rapidly and that long-term relationships can be superficial (Buchan, Croson, and Dawes 2002). Finally, still other research finds that relationships reach their peak during the second stage of a four-stage process (Jap and Anderson 2007) and that partners can revive relationships gone awry (Ring and Van de Ven 1994).

Given these findings, we separate relationship length from embeddedness and focus on two reasons the ability to sustain a long-term relationship may reduce the predicted dark-side effects of embeddedness in H_2. First, as relationships lengthen, suppliers and customers may be less worried about opportunism. Specifically, after cooperating for many years, partners are more likely to have developed safeguards and increased confidence that partners will not use shared knowledge opportunistically (Buvik and John 2000; Grayson and Ambler 1999; Jap and Anderson 2007). The long-standing relationship between VCST, a producer of components for the automotive industry, and market leader Mitsubishi Motors Corporation (MMC) illustrates this point. Commenting on the relationship, the R&D director of VCST notes, "We have been supplying MMC directly and indirectly for decades and product innovation has been key to our collaboration. However, only after more than a decade of bilateral cooperation, were we able and allowed to descend deep enough into their R&D and production systems which really boosted the efficacy of our innovation efforts" (VCST 2003). Second, time in the relationship increases partners' confidence in the quality of each other's knowledge (Anderson and Weitz 1989; Palmatier et al. 2006). In turn, this confidence may decrease perceptions of knowledge redundancy as supplier's motivation to work with the customer increases. Given this, the predicted dark-side effect should weaken. We predict the following:

> H_3: Longer relationships weaken the negative effect of embedded ties on the customer innovation knowledge–supplier innovation relationship.

Relationship formalization refers to the degree to which partners rely on explicit rules in managing their relationship (Sivadas and Dwyer 2000). How does formalization reduce the worries about customer opportunism and knowledge redundancy that produce the dark-side effects in H_2? First, formalization is a governance mechanism used to address opportunism in transaction cost analysis (Wathne and Heide 2000). Following this literature, formalization should bring a level of transparency to information exchanges, which reduces worries about customer opportunism (Wathne and Heide 2000). For example, the dairy group Campina requires partners to formalize procedures and property rights of both companies involved in innovation activities (De Vries 2008). An unwillingness to comply with such requirements may signal an increased likelihood of future opportunism. Formalization also has a positive effect on the degree of cooperation between partners (Dahlstrom, Dwyer, and Chandrashekaran 1995; Sivadas and Dwyer 2000). In support of these effects, Carson (2007) observes that as client skills increase, stronger controls improve the quality of creative tasks in outsourced innovation relationships.

Second, formalized rules reduce the likelihood of partner knowledge redundancy in three ways. To begin, formalization creates procedures, such as communication activities, completed at key points in the innovation process. This means that valuable information that may have been overlooked in an informal, less-structured process is now included. It also means that information is more structured and refined when shared, instead of communicated in bits and pieces over time. Formalizing the information in this way may mean some informal knowledge is lost. However, we suspect it will also reduce the perception of knowledge redundancy. Furthermore, by prioritizing activities, formalization should reduce trivial and repetitive informal flows of information that also feed a sense of redundancy (Deshpandé and Zaltman 1982; Maltz and Kohli 1996). Finally, John and Martin (1984) observe that formalization signals that top management values the activity, which motivates partners to contribute more novel information to the process, thereby reducing knowledge redundancy We predict

> H_4 Greater relationship formalization weakens the negative effect of embedded ties on the customer innovation knowledge–supplier innovation relationship

Customer relationship-specific investments are nonsalvageable investments a customer makes in a supplier (e g , Williamson 1983) and include investments in equipment, human resources, and information systems A customer's relationship-specific assets should weaken the negative moderating effect of embedded ties for two reasons First, these investments should reduce customer opportunism Specifically, these investments serve as hostages, and customers are unlikely to threaten those investments by behaving opportunistically (e g , Williamson 1983) Likewise, these investments signal customer commitment, which should reduce the supplier's worries about customer opportunism (Anderson and Weitz 1989, Wathne and Heide 2000)

Second, such investments may also improve the quality of customer insights, thereby reducing knowledge redundancy Specifically, if a customer makes relationship-specific investments in the supplier, the customer will gain more knowledge about the supplier, which should improve the customer's ability to offer valuable insights to the innovation process (Bensaou and Anderson 1999) For example, Nikon Metrology, a global leader in noncontact 3-D measuring technologies, was able to leverage knowledgeable customers such as Airbus, Volkswagen, and GE Advanced Materials more effectively when these customers made additional investments in digital benchmarks and reengineered assembly processes (Nikon Metrology 2008) We predict the following

> H_5 Greater customer relationship-specific investments weaken the negative effect of embedded ties on the customer innovation knowledge–supplier innovation relationship

The Impact of Innovation on Supplier Performance

Figure 1 includes the effect of supplier innovation on the supplier's strategic and financial performance Although not critical to our predictions, we examine these effects for three reasons First, support would confirm the nomological validity of the predicted relationships (Bagozzi 1980) Second, prior research has linked innovation to firm performance (e g , Han, Kim, and Srivastava 1998, Sorescu, Chandy, and Prabhu 2003) Third, a significant relationship between supplier innovation and performance increases the importance of our predictions

Method

The empirical context for this study is joint innovation between a supplier and a customer (i e , industrial buyers) in a manufacturing industry We test our model using a cross-sectional survey methodology involving key informants from supplier firms

Sample

We used Dun & Bradstreet's Market Direct database to obtain the phone numbers of manufacturing firms with more than 50 employees (n = 3146 firms) in the Netherlands Firms were telephoned, and we eliminated 1376 firms not engaged in joint product development with their customers from at least the development stage onward We eliminated another 910 firms because they were divisions of parent companies with central product development departments, were bankrupt, or had unlisted phone numbers Our final sample was 860 firms

A survey was mailed to a key informant in each firm In return for participation, we promised a customized report of results One hundred fifty-seven (18 3%) suppliers responded from firms in 19 Standard Industrial Classification codes, including food and kindred products, lumber and wood products, fabricated metals, and industrial machinery Using number of employees as a measure, we observe the following distribution of firm size in our sample 50–100 (35 7%), 101–200 (30 6%), 201–500 (12 7%), 501–1000 (2 5%), >1000 (3 2%), and missing (15 3%)

We examined nonresponse bias by comparing early respondents and late respondents (Armstrong and Overton 1977) and found no differences on any of our measures, in the number of employees, in the relative size of supplier and customer, or in industry classification Finally, the percentage response per industry (i e , two-digit Standard Industrial Classification code) is proportional to the percentage of Dutch companies operating in our industries

Our unit of analysis is the joint innovation project Informants were asked to report on "supplier and customer actions and outcomes in the project " To reduce problems associated with memory decay and selection bias, informants were asked to select a joint innovation project involving a customer that met two criteria The customer (1) helped develop a new product that was launched no longer than two years ago and (2) was involved in the joint new product development project from the development stage onward Informants were also reminded that the customer they select "may not be your most important or appreciated customer" We selected new product development team leaders in supplier firms as informants, given that they are in the best position to report on these projects Consistent with this expectation, informants reported high levels of firm experience (M = 12 years, SD = 10 years), team leader experience (M = 9 years, SD = 9 years), and high involvement in the customer relationship (seven-point scale M = 6, SD = 1 28)

Measures

Our measures are based on existing scales when available (see the Appendix) We measured supplier innovation using a scale adapted from Moorman (1995) and Kyriakopoulos and Moorman (2004) Given our definition of supplier innovation as the supplier's use of new or improved product, service, or process activities relative to the supplier's current activities, we asked suppliers to rate the extent to which "your company learned to do new or improved things during the joint innovation project " The suppliers then evaluated a list of innovation activities (e g , product, services, processes) [5]

We measured supplier innovation knowledge with a supplier proactive market orientation scale Adapted from Narver, Slater, and MacLachlan (2004), it examines the extent to which a supplier values innovation risk and has processes for uncovering and meeting latent customer needs Customer innovation knowledge focuses on customer's lead-user abilities using a scale designed to reflect Von Hippel and colleagues' ideas about lead users' skills—the ability to identify needs and new solutions and the ability to apply existing solutions in novel ways

We measured embedded ties using Rindfleisch and Moorman's (2001) scale We measured relationship length as the number of years the customer and supplier firms have worked with each other (Jap 1999, Johnson and Sohi 2001) Following standard practice (e g , Buvik and John 2000), we used the log of relationship length in our analysis We measured relationship formalization using Sividas and Dwyer's (2000) scale and customer relationship-specific investments using a scale by Rokkan, Heide, and Wathne (2003)

As shown in Figure 1, we assessed two additional supplier outcomes Supplier financial performance measures the extent to which the product resulting from the joint innovation project has achieved its revenue and profit objectives (see Moorman 1995) Supplier strategic advantage refers to the strategic benefits of the joint project that enable the supplier to compete more effectively in the marketplace relative to competitors (adapted from Jap 1999)

We included three control variables in our model Customer dependence is a single item adopted from Johnson and Sohi (2001) We included it as a control variable because unequal relationships are prone to fail (Sivadas and Dwyer 2000) and to reduce information sharing (Frazier et al 2009) We included the rate of change in customer preferences (market turbulence) and technology introductions (technology turbulence) using Jaworski and Kohli's (1993) scales Research has shown that environmental turbulence reduces the value of a firm's stored knowledge (Hanvanich, Sivakumar, and Hult 2006, Moorman and Miner 1997)

Measure Validation

Descriptive indicators for our measures appear in Table 1 To purify our reflective measures, we ran a confirmatory factor model and dropped items with low factor loadings or high cross-loadings This involved dropping six items from a pool of 45 items As a check, we tested the model with all items included and results replicate Fit indexes support the resulting model (χ^2 = 779 84, nonnormed fit index = 91, confirmatory fit index = 92, standardized root mean square residual = 08, and root mean square error of approximation = 04), indicating measure unidimensionality (Gerbing and Anderson 1988) Each observed indicator loads significantly on the intended latent constructs, and each factor's composite reliability exceeds acceptable thresholds (Bagozzi and Yi 1988), demonstrating convergent validity and reliability As evidence of discriminant validity, the average variance extracted from each construct exceeds the squared correlation between constructs (Fornell and Larcker 1981) We examined our formative scales following the recommendations of Bollen and Lennox (1991) and Diamantopoulos and Winklhofer (2001) To assess item collinearity, we ran a regression analysis of all items as independent variables on each single item (dependent variables) and found no evidence of collinearity

Two variables—relationship length and customer dependence—suffer from missing data (33 8% and 29 9%, respectively) Because these questions are innocuous, we suspect the problem is that both appeared at the end of the questionnaire We replaced missing values with estimated values using a multiple imputation procedure (Rubin 1987, Schafer 1999) To perform the imputation, we used the expectation-maximization algorithm to derive a set of initial parameter values on which the Markov chain Monte Carlo process is based We repeated this process three times to create three independent data sets, enough to characterize the variability between imputations Then we subjected each of the three data sets to the analyses and combined the results by calculating the single values reported in our results, as is standard in imputation-based analyses

Common Method Bias Test

Beyond the procedural remedies taken to mitigate common method variance (CMV), we assessed its presence in two ways First, Harman's one-factor test identifies multiple factors with eigenvalues greater than 1 in the unrotated factor structure, which means that CMV is not a concern (Podsakoff and Organ 1986) Second, we selected a marker variable (MV) to proxy method variance (Lindell and Whitney 2001) We selected product development speed (Rindfleisch and Moorman 2001, see the Appendix) as the MV because it is theoretically unrelated to at least one of our constructs As an estimate for CMV, we took the most conservative option and selected the lowest positive correlation between the MV and one of our criterion variables (ρ = 08) Then we partialed out this correlation from all bivariate correlations to remove the effect of CMV Given that variables have significant zero-order correlations, we conclude that CMV is not a concern (Grayson, Johnson, and Chen 2008)

Model and Estimation

We use mean-centered variables to construct our interactions As a result, coefficients for the individual effects

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[5] Our phrasing could be viewed as stopping with learning and not including action However, given that we specifically requested respondents to focus on "supplier and customer actions and outcomes in the project" in the survey, we do not believe this is a concern More important, we find that supplier innovation has significant effects on two firm performance outcomes Such effects would not be possible if supplier innovation stopped at learning and did not include action Finally, to validate our ideas, we ran a posttest among a similar sample of Dutch managers We asked them to reflect on their most recent project and to rate two outcomes on the same seven-point scale used in our study (1 = "strongly disagree," and 7 = "strongly agree") Question 1 asked the managers to "rate the extent to which your company learned to do new or improved things," and Question 2 asked managers to "rate the extent to which your company did new or improved things " The results indicate that managers (n = 26) responded to both these phrases similarly ($M_{question1}$ = 4 846, SD = 880 vs $M_{question2}$ = 4 885, SD = 952, t_{25} = – 296, n s)

TABLE 1
Measure Statistics

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Supplier innovation	5 05	75	N A														
Supplier innovation knowledge	5 43	99	35**	(83)													
Customer innovation knowledge	4 93	1 17	29**	29**	(85)												
Embedded ties	5 58	86	22**	22**	13	(72)											
Relationship length	12 28	12 36	03	– 03	– 04	00	N A										
Relationship formalization	4 28	1 49	04	17*	01	11	02	N A									
Customer relationship-specific investments	2 96	97	15	09	15	25**	09	03	(84)								
Supplier financial performance	4 73	1 38	23**	16*	11	33**	12	02	14	(93)							
Supplier strategic advantage	5 27	1 20	32**	21**	20*	27**	06	– 02	19*	43**	(81)						
Customer dependence	18	39	07	09	– 01	01	– 09	– 12	02	04	03	N A					
Market turbulence	4 30	1 18	20*	20*	27**	09	04	15	13	11	00	– 07	(83)				
Technological turbulence	4 50	1 16	15	14	14	05	02	19*	11	02	11	04	40**	(80)			
Opportunism	2 84	1 10	– 24**	– 26**	– 25**	– 25**	09	28**	– 04	– 22**	– 31**	07	– 06	07	(78)		
Knowledge redundancy	2 94	1 26	– 17*	– 09	– 12	– 14	– 01	12	11	– 02	– 07	– 07	09	06	07	N A	
Marker variable	4 24	1 00	14	– 06	02	05	05	06	19*	12	08	00	– 01	04	12	– 16*	(79)

$^{*}p < 05$
$^{**}p < 01$
Notes The composite reliability for each measure is on the diagonal Formative and single-item scales are denoted with N A

reflect the simple effect of the predictor variable (e g , customer innovation knowledge) at the mean level of the moderator (i e , embedded ties) instead of the effect at the zero level This is valuable in our analysis given that the zero-level is outside the relevant range of our variables Thus, mean-centering aids in the interpretation of our results

We estimated a system of three equations, one for each dependent variable (supplier innovation, supplier strategic advantage, and supplier financial performance) We employed a three-stage least squares (3SLS) procedure, which is appropriate given supplier innovation and supplier strategic advantage are endogenous Our model involves a recursive system of equations because the third outcome variable, supplier financial performance, is not endogenous Because we expect the errors across equations to be correlated, ordinary least squares and 3SLS should produce consistent results, but 3SLS yields asymptotically more efficient parameter estimates (Gatignon 2003, Greene 2002) A Hausman specification test indicates that while the 3SLS and ordinary least square estimations are consistent, the 3SLS estimator is more efficient The equations estimated are as follows

$$
\begin{aligned}
(1)\quad \mathrm{SI} = {} & c_1 + \beta_1(\mathrm{SIK}) + \beta_2(\mathrm{CIK}) + \beta_3(\mathrm{ET}) + \beta_4(\mathrm{ET} \times \mathrm{SIK}) \\
& + \beta_5(\mathrm{ET} \times \mathrm{CIK}) + \beta_6(\mathrm{CIK} \times \mathrm{SIK}) + \beta_7(\mathrm{LENGTH}) \\
& + \beta_8(\mathrm{SIK} \times \mathrm{LENGTH}) + \beta_9(\mathrm{CIK} \times \mathrm{LENGTH}) \\
& + \beta_{10}(\mathrm{ET} \times \mathrm{LENGTH}) + \beta_{11}(\mathrm{ET} \times \mathrm{SIK} \times \mathrm{LENGTH}) \\
& + \beta_{12}(\mathrm{ET} \times \mathrm{CIK} \times \mathrm{LENGTH}) + \beta_{13}(\mathrm{FORM}) \\
& + \beta_{14}(\mathrm{SIK} \times \mathrm{FORM}) + \beta_{15}(\mathrm{CIK} \times \mathrm{FORM}) \\
& + \beta_{16}(\mathrm{ET} \times \mathrm{FORM}) + \beta_{17}(\mathrm{ET} \times \mathrm{SIK} \times \mathrm{FORM}) \\
& + \beta_{18}(\mathrm{ET} \times \mathrm{CIK} \times \mathrm{FORM}) + \beta_{19}(\mathrm{CINVEST}) \\
& + \beta_{20}(\mathrm{SIK} \times \mathrm{CINVEST}) + \beta_{21}(\mathrm{CIK} \times \mathrm{CINVEST}) \\
& + \beta_{22}(\mathrm{ET} \times \mathrm{CINVEST}) + \beta_{23}(\mathrm{ET} \times \mathrm{SIK} \times \mathrm{CINVEST}) \\
& + \beta_{24}(\mathrm{ET} \times \mathrm{CIK} \times \mathrm{CINVEST}) + \text{control variables} + \varepsilon_1
\end{aligned}
$$

$$
\begin{aligned}
(2)\quad \mathrm{SSTRAT} = {} & c_2 + \beta_{25}(\mathrm{SI}) + \beta_{26}(\mathrm{SIK}) + \beta_{27}(\mathrm{CIK}) \\
& + \text{control variables} + \varepsilon_2
\end{aligned}
$$

$$
\begin{aligned}
(3)\quad \mathrm{SFIN} = {} & c_3 + \beta_{28}(\mathrm{SI}) + \beta_{29}(\mathrm{SSTRAT}) + \beta_{30}(\mathrm{SIK}) \\
& + \beta_{31}(\mathrm{CIK}) + \text{control variables} + \varepsilon_3,
\end{aligned}
$$

where c = constant, SI = supplier innovation, SIK = supplier innovation knowledge, CIK = customer innovation knowledge, ET = embedded ties, LENGTH = relationship length, FORM = relationship formalization, CINVEST = customer investments, SSTRAT = supplier strategic advantage, SFIN = supplier financial performance, and ε = disturbance terms[6]

We inspected bivariate correlations and variance inflation factors, neither of which indicated multicollinearity problems Nevertheless, we also followed Echambadi and Hess's (2007) recommendation to estimate random subsets of the data to test the stability of coefficients and observed no changes in our parameter estimates across five such sets

Results

Table 2 contains the results for Models 1–3 We begin by discussing the tests of our hypotheses We then examine the role of knowledge redundancy and opportunism as mediators that provoke the hypothesized dark-side effects Because we did not make formal hypotheses about these mediators, we offer this analysis as a process validation for our arguments and to sort out whether knowledge redundancy, opportunism, or both are operating Finally, to confirm the nomological validity of the hypothesized links, we test the effect of supplier innovation on firm performance

Tests of Hypothesized Relationships

Because our hypotheses predicted both two-way interactions (H_1 and H_2) and three-way interactions that moderate these two-way effects (H_3, H_4, and H_5), we tested our predictions in several steps (Aiken and West 1991, Cohen et al 2003) First, given that the estimates for our two-way interactions are conditional on the mean value of the three-way moderators, we first examined our three-way interactions Second, if the three-way interactions were significant, we evaluated the two-way interactions over the range of values for the three-way moderators using Schoonhoven's (1981) approach If not, we directly interpreted the two-way effects

Before examining the details of our hypotheses, we performed a Wald test of the model including all three-way interactions against a more restricted model of the main effects and two-way interactions only The results confirm the improvement in fit from the three-way interactions ($\chi^2 = 29\ 91, p < 01$), which means we should interpret the results from the model with the three-way interactions

Our bright-side hypothesis (H_1) predicts a positive interaction between supplier innovation knowledge (SIK) and embedded ties (ET) Our results indicate no significant three-way interactions for ET × SIK Thus, ET × SIK is not conditional on the values of a third variable Therefore, we proceed to examine the ET × SIK coefficient directly We find that it is not significant ($\beta = -03$, not significant [n s]) On the basis of these results, we reject H_1 Instead, our results indicate that SIK has a significant direct effect on supplier innovation ($\beta = 23, p < 01$)

Our dark-side hypothesis (H_2) predicts a negative interaction between customer innovation knowledge (CIK) and ET We observed no interaction between these variables at the mean values of relationship length, relationship formalization, and customer investments ($\beta = 02$, n s) However, we do find significant three-way interactions involving ET × CIK and the moderating variables Thus, we evaluate the ET × CIK interaction across the range of values for relationship length, relationship formalization, and customer investments using Schoonhoven's (1981) approach This

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[6] Although we did not predict them, we include the three-way interactions that involve ET × SIK × LENGTH, ET × SIK × FORM, and ET × SIK × CINVEST in this model because we want to ensure that these proposed "solutions" for the dark-side effects in H_2 do not also undo the proposed bright-side effects in H_1 Deleting these terms from the equations does not change the results of our hypothesized effects

TABLE 2
3SLS Model Estimation Results

Predictor Variables	Supplier Innovation β (SE)[a]	Supplier Strategic Advantage β (SE)[a]	Supplier Financial Performance β (SE)[a]
Constant	– 07 (06)	02 (11)	– 06 (14)
Customer innovation knowledge (CIK)	04 (05)	– 03 (10)	05 (12)
Supplier innovation knowledge (SIK)	23 (06)**	– 12 (12)	26 (14)
Embedded ties (ET)	10 (06)		
ET x SIK (H_1)	– 03 (08)		
ET x CIK (H_2)	02 (06)		
CIK x SIK	07 (04)		
Relationship length (LENGTH)	– 04 (05)		
SIK x LENGTH	07 (05)		
CIK x LENGTH	– 09 (05)*		
ET x LENGTH	– 11 (05)*		
ET x SIK x LENGTH	01 (06)		
ET x CIK x LENGTH (H_3)	11 (05)*		
Relationship formalization (FORM)	03 (04)		
SIK x FORM	00 (05)		
CIK x FORM	– 07 (05)		
ET x FORM	05 (03)		
ET x SIK x FORM	– 05 (05)		
ET x CIK x FORM (H_4)	13 (04)**		
Customer relationship-specific investments (CINVEST)	10 (04)**		
SIK x CINVEST	03 (04)		
CIK x CINVEST	– 08 (03)**		
ET x CINVEST	– 02 (05)		
ET x SIK x CINVEST	– 01 (06)		
ET x CIK x CINVEST (H_5)	12 (05)*		
Customer dependence	07 (14)	– 15 (28)	36 (34)
Market turbulence	05 (06)	– 16 (11)	43 (14)**
Technological turbulence	00 (05)	– 04 (10)	– 11 (13)
Supplier innovation		1 59 (20)**	–1 88 (29)**
Supplier strategic advantage			1 39 (16)**
System-weighted R-square[b]		39	

*p< 05
**p< 01
[a] Standardized coefficients with standard error in parentheses
[b] The reported system-weighted R-square measure is an overall fit measure across the three equations in the system

enables us to identify the conditions under which the dark-side effect in H_2 occurs and when it is converted to a bright-side effect as predicted in H_3, H_4, and H_5 Table 3 and Figure 2 show the results

In support of H_3, we find a positive and significant effect of ET x CIK x LENGTH ($\beta = 11, p < 05$) As Figure 2, Panel A, shows, the moderator (relationship length) is on the x-axis, and the coefficient of the ET x CIK impact on supplier innovation is on the y-axis In support of our prediction, the line shows that the effect of ET x CIK on supplier innovation is negative (positive) when relationship length is short (long) To determine the details of the interaction, Table 3 (second column) contains the coefficients for the ET x CIK interaction at varying length levels There, we observe that although the interaction is negative for short relationships (–1 SD and –2 SD), the relationship is not significant, and no dark side is evident However, the effect of ET x CIK on supplier innovation becomes significant and positive as the relationship becomes longer (+2 SD) This reflects the bright side

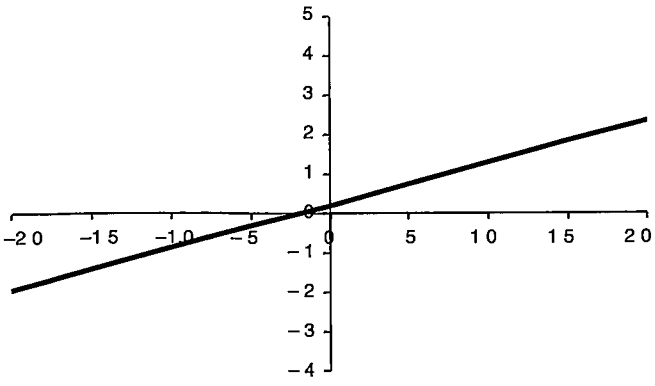
TABLE 3
How the Interaction Effect of Customer Innovation Knowledge and Embedded Ties Varies Across Different Levels of the Moderators

Moderator Level	Relationship Length (H_3) β(SE)[a]	Relationship Formalization (H_4) β(SE)[a]	Customer Relationship-Specific Investments (H_5) β(SE)[a]
–2SD	– 19 (12)	– 47 (13)**	– 34 (14)*
–1SD	– 08 (08)	– 26 (08)**	– 15 (07)*
Mean	02 (06)	02 (06)	02 (06)
+1SD	20 (18)	16 (08)*	23 (14)
+2SD	23 (11)*	37 (13)**	42 (21)*

*p< 05
**p< 01
[a] Standardized coefficients of ET x CIK with standard error in parentheses

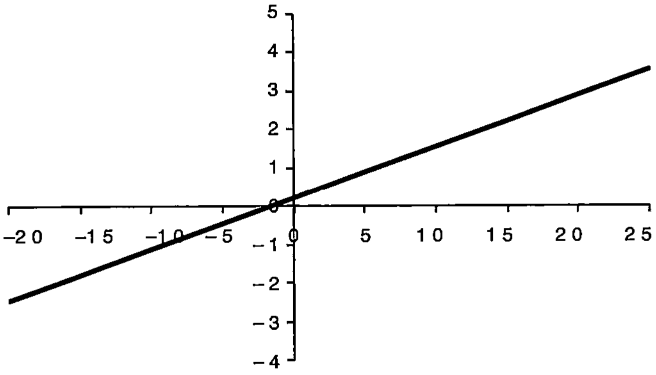
FIGURE 2
Factors Mitigating the Dark Side of Embedded Ties

A: Relationship Length (H_3)



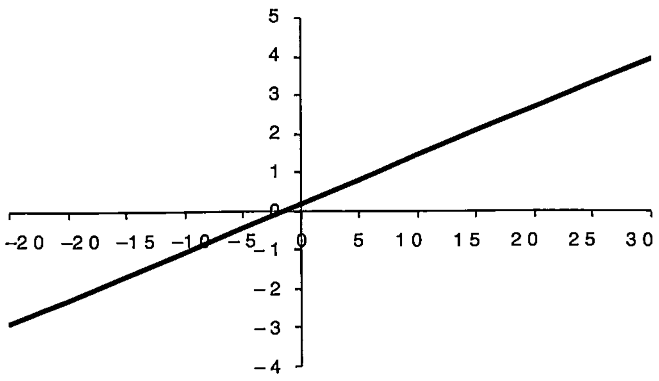
$$\frac{\left(\frac{dSupplier\ Innovation}{dCustomer\ Innovation\ Knowledge}\right)}{dEmbedded\ Ties} = 02 + 11(Relationship\ Length)$$

B: Relationship Formalization (H_4)



$$\frac{\left(\frac{dSupplier\ Innovation}{dCustomer\ Innovation\ Knowledge}\right)}{dEmbedded\ Ties} = 02 + 13(Relationship\ Formalization)$$

C: Customer Relationship-Specific Investments (H_5)



$$\frac{\left(\frac{dSupplier\ Innovation}{dCustomer\ Innovation\ Knowledge}\right)}{dEmbedded\ Ties} = 02 + 12(Customer\ Investments)$$

In support of H_4, the results indicate a positive and significant effect of ET × CIK × FORM ($\beta = 12, p < 05$) Figure 2, Panel B, shows a negative (positive) effect of ET × CIK on supplier innovation at low (high) formalization levels Table 3 (third column) contains the coefficients associated with the ET × CIK interaction at varying relationship formalization levels These analyses indicate that at low levels of formalization (–1 SD and –2 SD), there is a significant dark-side effect for ET × CIK on supplier innovation As formalization increases (+1 SD and +2 SD), this effect becomes positive and significant, reflecting the bright side

In support of H_5, results indicate a positive and significant effect of ET × CIK × CINVEST ($\beta = 13, p < 01$) Similar to the effect of the other two moderators, we show in Figure 2, Panel C, that the effect of ET × CIK on supplier innovation is negative (positive) when customer investments are low (high) Table 3 (fourth column) contains the coefficients for the ET × CIK interaction at varying customer investment levels As with formalization, these analyses indicate that at low levels of customer investments (–1 SD and –2 SD), there is a significant dark-side effect for ET × CIK on supplier innovation As customer investments increase (+1 SD and +2 SD), this effect becomes positive and significant, reflecting the bright side

Our H_3–H_5 results lead us to conclude that H_2 (the dark side) is supported for certain ranges of values of the three-way moderators To determine the range of values for which H_2 is supported, we located the point where the line crosses the x-axis in Figure 2 (Heide and Wathne 2004, Schoonhoven 1981) Results indicate that the effect of ET × CIK is positive when relationship length exceeds – 19, when relationship formalization exceeds – 16, and when customer investment exceeds – 17 These levels are just below the mean values, which are all 0 because we mean-centered them

Mediation Process Validation: The Role of Knowledge Redundancy and Opportunism

We explain the dark side H_2 interaction of ET × CIK on supplier innovation by arguing that it is caused by increased opportunism and perceptions of knowledge redundancy In turn, the three-way interactions in H_3–H_5 argue that this dark side is undone by reducing opportunism and knowledge redundancy Next we test for these mediating roles as a process validation of our arguments [7] Given that we have moderators influencing mediation, we have a case of mediated moderation and follow Muller, Judd, and Yzerbyt (2005)

We measured opportunism using Jap's (2003) supplier opportunism scale ($\alpha = 81$) We measured knowledge redundancy using a single item from Rindfleisch and Moorman (2001) These measures, listed in the Appendix, were validated with the other measures (see Table 1)

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[7] We also include this test because there is an alternative explanation for the role of knowledge redundancy Specifically, high levels of customer innovation knowledge could lead to lower levels of knowledge redundancy because vertical partners occupy different places in the value chain This may dampen supplier innovation because the supplier is less likely to have the necessary absorptive capacity to utilize the customer's knowledge

Given our prior results, our analysis of this mediating role must be restricted to those conditions in which we identified a dark-side effect for ET × CIK Table 3 indicates that this occurs when relationship formalization is low (–1 SD and –2 SD) or customer relationship-specific investments are low (–1 SD and –2 SD) To focus attention on these conditions, we used the spotlight approach (Aiken and West 1991) in our three-step test of mediation from Muller, Judd, and Yzerbyt (2005)

In Step 1, we set formalization and customer investment levels to be low (by subtracting two standard deviations from the mean-centered main effect) before constructing the interactions This enables us to examine the simple effect of the ET × CIK interaction on supplier innovation in this condition, which is negative and significant ($\beta = -1\ 00$, $p < 01$) Step 2 involves estimating two models with the same predictor variables but with opportunism and knowledge redundancy as the dependent variables Results indicate that ET × CIK positively affects opportunism ($\beta = 75$, $p < 05$) but has no effect on knowledge redundancy ($\beta = 18$, n s) Because ET × CIK does not predict knowledge redundancy, knowledge redundancy cannot mediate the effect of ET × CIK on supplier innovation In the third step, we estimate the Step 1 model again but also add opportunism as a predictor Opportunism is significant ($\beta = -11, p < 001$) and the coefficient of the ET × CIK interaction decreases from –1 00 to – 59, which is marginally significant (Sobel z = –1 79, $p = 07$) This pattern indicates a case of mediated moderation for opportunism but not for knowledge redundancy

To provide insight into the mediated moderation findings for H_3–H_5, we apply the same three steps to those conditions that undo the dark side of ET × CIK Thus, we set length, formalization, and customer investments at two standard deviations above the main effect before constructing the interactions We should observe the opposite pattern in all three steps For Step 1, we observe a positive, significant impact for the simple effect of ET × CIK on supplier innovation ($\beta = 95, p < 01$) In Step 2, we observe a negative simple effect of ET × CIK on opportunism ($\beta = -82, p <$ 01) but no effect on knowledge redundancy ($\beta = -29$, n s) In Step 3, we estimate the Step 1 model again, but also add opportunism as a predictor We observe that opportunism is significant ($\beta = -11, p < 001$) and that the ET × CIK interaction decreases from 95 to 42, which is marginally significant (Sobel z = 1 78, $p = 08$) This pattern indicates mediated moderation as opportunism decreases when the moderators are at high levels

Supplier Innovation and Firm Performance

Finally, according to the estimates reported in Table 2, we conclude that supplier innovation has a direct positive effect on supplier strategic advantage ($\beta = 1\ 59$, $p < 01$) but a direct negative effect on supplier financial performance ($\beta = -1\ 88, p < 01$) In addition, supplier strategic advantage has a direct positive effect on supplier financial performance ($\beta = 1\ 39, p < 01$) Using these estimates, we calculate the total impact of the direct and indirect (through strategic advantage) effects of supplier innovation on financial performance Results indicate a positive total effect of innovation on financial performance (total effect = 33) [8]

Discussion

Research Implications and Directions for Further Research

The effect of embedded ties We find that embedded ties are not an inherently good or bad mechanism for managing interfirm innovation relationships Instead, the interaction of embedded ties and customer innovation knowledge produces dark-side effects *and* bright-side effects on supplier innovation under certain relational and governance conditions Given the importance of these market-based assets to the firm, further research should continue to investigate the interaction of relational and knowledge features of partnerships For different insights, we advise ethnographic work to examine how knowledge and relationship factors evolve and interact in joint innovation activities between firms

Our work also offers insight into why embeddedness has a dark-side effect We find that opportunism, not knowledge redundancy, seems to be operating These effects could be replicated in further research given our weak measure of knowledge redundancy Moreover, research should also consider other dark-side mechanisms, including loss of objectivity (Grayson and Ambler 1999) and the tendency to rely on current partners when new partners should be sought (Sorenson and Waguespack 2006) Further research should examine whether returning to a partner is only problematic when the firm also limits its number of partners A larger network of partners ensures not only that a firm will have access to new ideas but also that replacements are available, which may motivate partners to work harder to add value

Opportunism as a dark-side mechanism Our study expands research on opportunism in buyer–seller relationships (Wathne and Heide 2000) Whereas prior studies have examined opportunism as an antecedent (Jap and Anderson 2003) or an outcome (Heide, Wathne, and Rokkan 2007, Rokkan, Heide, and Wathne 2003), we examine it as a mediator This is the direction first considered by Moorman, Zaltman, and Deshpandé's (1992) post hoc theorizing for the negative effects of trust on knowledge use in marketing research relationships and examined empirically in Grayson and Ambler (1999) Given our results, further research should examine how opportunism mediates other aspects of marketing relationships

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[8] We computed the indirect effect (2 21) by multiplying the coefficient of the relationship between strategic advantage and innovation (1 59) with the coefficient of the relationship between strategic performance and financial performance (1 39) The direct effect (holding the mediator constant) of innovation on financial performance is –1 88 Summing the indirect and direct paths leads to a total effect of 2 21 – 1 88 = 33 This positive total effect, which also explains the positive correlation coefficient between supplier innovation and financial performance in Table 1, is more complex than previous research has suggested Specifically, following Shrout and Bolger (2002), we find that the negative effect of innovation on financial performance is compensated by the positive indirect effect of innovation (through strategic advantage) on financial performance In other words, innovation may involve short-term financial costs, despite a positive strategic advantage (e g , Campbell and Cooper 1999, Inkpen 1996)

Knowledge redundancy as a dark-side mechanism Rindfleisch and Moorman (2001) find that knowledge redundancy has a negative effect on information acquisition and a positive effect on information utilization in new product alliances How can we reconcile these findings with our findings for knowledge redundancy? First, Rindfleisch and Moorman examine the independent effects of ties and shared knowledge, whereas we examine the interaction of customer innovation knowledge and embedded ties Thus, our questions are distinct Second, all our relationships are vertical, whereas Rindfleisch and Moorman examine both horizontal and vertical relationships This means that redundant knowledge may be lower in our sample because partners occupy unique positions in the value chain and therefore may not have reached sufficient levels to have a positive effect Third, perhaps knowledge redundancy due to a shared position in the value chain and knowledge redundancy due to knowledge exchange between partners affect relationships differently Like most studies in this area, our research confounds the two Further research should ferret out these effects

Fourth, it is also possible that knowledge redundancy has an inverted U-shaped relationship with innovation[9] In this view, knowledge redundancy facilitates innovation up to a point because it helps partners share and comprehend knowledge However, after this point, knowledge redundancy begins to reduce innovation In our study of vertical partnerships, we find the expected negative linear relationship between knowledge redundancy and supplier innovation ($\beta_{KR \rightarrow SI} = -08, p < 05$) but not an inverted U-shaped relationship ($\beta_{KR \times KR \rightarrow SI} = 07$, n s) Further research could consider when knowledge redundancy will have a linear or a nonlinear effect

The effect of supplier innovation knowledge Our study is the first of which we are aware to consider how forming a relationship with a customer can influence a supplier's use of its own knowledge We theorized that a closer relationship with customers would improve a supplier's use of its own knowledge Instead, we find an unconditionally positive effect for supplier innovation knowledge on supplier innovation levels, confirming past research As with customer knowledge, further research could benefit from a deeper or more controlled analysis of the effects of supplier innovation knowledge Further research could also consider the interaction of supplier innovation knowledge, customer innovation knowledge, and embedded ties[10] We see two interesting possibilities for this interaction First, supplier innovation knowledge could function as a safeguard that mitigates the dark-side interaction of ET × CIK given that both partners are risking high levels of knowledge This may be especially so if partners make bilateral idiosyncratic investments in the relationship (Jap and Anderson 2003) Alternatively, supplier innovation knowledge could worsen the dark-side effect by heightening the supplier's potential losses if it behaves opportunistically If observed, research could also consider relational and governance solutions to this negative interaction, though the complexity of these higher-order interactions may weaken insight

Innovation and cocreation The current study dovetails with recent work on supplier–customer cocreation (Vargo and Lusch 2008) This cocreation logic challenges the alchemy of innovation (Prahalad and Ramaswamy 2003, 2004) because it moves the epicenter of innovation from the firm to cocreation relationships (Tuli, Kohli, and Bharadwaj 2007, Vargo and Lusch 2008) Our findings build on this cocreation logic by pointing to specific ways knowledge and relationship assets interact in the cocreation process to create value This is an attempt to marry the cocreation literature with the interorganizational relationship literature To date, these literatures have evolved independently, with the cocreation literature emphasizing the firm's ability to create value with customers and the interorganizational literature emphasizing the firm's ability to capture value from cooperating with customers

Role of networks Networks are an increasingly important issue in interfirm research in general (Achrol and Kotler 1999, Anderson, Håkansson, and Johanson 1994, Heide and Wathne 2004, Swaminathan and Moorman 2009) and innovation research specifically (e g , Ahuja 2000, Fang 2008) An issue relevant for this research is how a dense network of firms around the customer–supplier relationship might influence our results One view is that concerns about opportunism will decrease if the partners exist in a dense network (Burt 1992) because the threat of news of bad behavior spreading to interconnected partners deters such opportunism (Ahuja 2000, Rowley, Behrens, and Krackhardt 2000) However, network density may also limit the amount of novel information available to partners, thereby reducing innovation (Fang 2008) Other network characteristics, such as efficiency and centrality, may play similarly important roles

Toward a theory of innovation relationships Our study contributes to an emerging body of interfirm research involving creative activities, such as design, market research, advertising, and new product development relationships Early work shows that such relationships may require distinctive theory For example, Carson (2007) shows that the creative needs of the project influence the relative effectiveness of various relationship control strategies As an example from our study, we find that formalization, a control strategy, increases innovation, in contrast to Mohr, Fisher, and Nevin's (1996) study of channel relationships, which finds that control-based governance strategies weaken the effect of information exchange on relationship performance

Generalizability of our findings First, because our findings are from a product context, further research should investigate whether these effects are worse in a services context, in which supplier knowledge may be more difficult to protect Second, given that our sample is limited to one country, further research should also examine whether these effects appear in cultures in which business is already deeply affected by relationships and reciprocity (e g , *guanxi* in China, Grayson, Johnson, and Chen 2008, Gu, Hung, and Tse 2008) Finally, further research could improve our measures of embeddedness, formalization, and knowledge redundancy by increasing the number of items and our measure of supplier innovation by focusing on the actions firms take rather than on the degree to which firms learn to take these actions

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[9] Thanks to one of the anonymous reviewers for suggesting this direction for further research

[10] Thanks to one of the anonymous reviewers for sharing this interesting prediction

Managerial Implications

Manage all facets of joint innovation relationships Under pressure to release more innovative products faster, firms are increasingly engaging in joint innovation projects with their business customers (Bonner and Walker 2004) However, our research indicates that these benefits do not evolve automatically from innovation partnerships Instead, these relationships must be managed with attention to knowledge, relational, and governance qualities This heightened focus has led many firms to appoint a chief relationship officer to the C-suite

Invest in supplier innovation knowledge Our results offer unequivocal advice to suppliers to build their innovation knowledge This knowledge provides a strong main effect on supplier innovation regardless of the knowledge level of the customer or the embeddedness level of the relationship with the customer Building supplier innovation knowledge should involve increasing declarative knowledge about the innovation domain as well as procedural knowledge about how to perform key tasks in the innovation process Our findings show that managers should emphasize skills such as extrapolating customer trends into the future, brainstorming about customer use of innovation, and uncovering latent needs

Reduce the risks of working with a smart customer Our results indicate that suppliers perceive higher levels of customer opportunism when they work in close relationships with knowledgeable customers However, these worries only emerge when relationship formalization is low or when customer relationship-specific investments are low Suppliers should therefore increase these safeguards when working in close relationships with knowledgeable customers If not, supplier innovation will decrease Increasing formalization might involve setting timetables for deliverables and requiring regular meetings that conform to agreed-on procedures for working together, including sharing and using information in the relationship At the same time, firms should take care not to overly bureaucratize the relationship, which may reduce creativity Increasing the customer's relationship-specific investments could involve requiring the customer to dedicate employees specifically to this relationship and training them in the supplier's products, technologies, and procedures

Manage the benefits of time Close and long relationships with knowledgeable customers increase supplier innovation Suppliers are therefore advised to be patient for these bright-side effects to emerge over the course of customer relationships and to consider what types of investments will increase the likelihood they will retain their customer relationships over time Suppliers could also benefit from examining the quality of customer insights over time to gain a better understanding of the influence of time Specifically, the efficiency of working with a longtime customer should be weighed against the possibility of new insights coming from a new customer Both the customer and supplier can manage this trade-off, as we discuss in the next section

Add value as a lead user Following from our results, we recommend that knowledgeable customers take actions to neutralize supplier concerns First, customers need to manage supplier perceptions of customer opportunism We cannot determine whether customers were behaving opportunistically However, supplier worries about a close relationship with a knowledgeable customer seem to be commonplace in our sample This indicates that opportunism concerns may be less a function of what the customer does and more a function of the potential risks that the customer poses to the supplier Proactive customer strategies such as making supplier-specific investments or formalizing the relationship should reduce these concerns Second, our findings indicate that customers need to worry less about how a close relationship with suppliers will lead to perceptions of knowledge redundancy This does not seem to be a problem in our sample However, we find that when knowledge redundancy does occur, it reduces supplier innovation Therefore, customers are advised to understand what actions they take or fail to take that can ensure reduced perceptions of knowledge overlap For example, new team members and using novel research techniques could keep the relationship fresh

Look to the strategic benefits of joint innovation Our findings indicate that joint innovation achieves its financial performance primarily through strategic advantage This result is remarkably consistent with prior warnings that joint innovation for customer solutions provides no immediate financial benefits and explains the difficulty firms often have persisting with innovation in cocreation (Johansson, Krishnamurthy, and Schlissberg 2003, Tuli, Kohli, and Bharadwaj 2007) Thus, managers should not base their evaluations of joint innovation only on the immediate financial performance of the innovation but should also take into account the effect of the innovation on the strategic position of the firm

Conclusion

Joint innovation between suppliers and customers is an increasingly common strategy for B2B firms Our study shows that there are important contingencies that determine when building embedded relationships with customers pays off for suppliers Our findings indicate that the payoff depends on the customer's innovation knowledge and the relational and governance safeguards that suppliers put in place to manage the embedded relationship Specifically, embedded ties weaken the supplier's ability to leverage customer knowledge for innovation under conditions of low relationship formalization and low levels of customer relationship-specific investments These dark-side effects are caused by increased worries about customer opportunism However, suppliers that lengthen the relationship, formalize the relationship, and ask customers to make relationship-specific investments can achieve a positive effect on innovation when forming an embedded relationship with a knowledgeable customer This is the bright side of embedded ties In contrast, suppliers benefit from their own innovation knowledge regardless of the strength of the customer relationship

APPENDIX
Constructs and Items

Constructs and Items	Factor Loadings
Supplier Innovation (adapted from Kyriakopoulos and Moorman 2004, Moorman 1995)	
Please indicate to which extent your company *has learned to do new or improved things during the joint innovation project with regard to the issues mentioned below*	
•Targeting and segmentation	Formative scale
•Customer service	
•Product positioning and differentiation	
•Generating ideas for other products	
•Distribution	
•Communication and promotion	
Supplier Innovation Knowledge (Narver, Slater, and MacLachlan 2004)	
Please consider your company's *characteristics with regard to behaviors in the market and indicate the degree to which you agree with the following statements*	
Our company	
•Helps customers anticipate developments in their markets	66
•Continuously tries to discover additional needs of their customers of which they are unaware	61
•Incorporates solutions to unarticulated customer needs in its new products and services	71
•Brainstorms on how customers [could] use their products and services	83
•Extrapolates key trends to gain insight into what users in a current market will need in the future	67
•Our company introduces new products even at the risk of making its own products obsolete [a]	
•Our company searches for opportunities in areas where customers have a difficult time expressing their needs [a]	
Customer Innovation Knowledge (based on Von Hippel 1986, Von Hippel and Katz 2002)	
Please consider your customer's *characteristics with regard to behavior in the market and indicate the degree to which you agree with the following statements The customer*	
•Tends to conduct thorough research for the available options offered by suppliers to identify new marketing possibilities that could address our own and our customers' needs	70
•Has, in the past three years, invested a substantial amount of time and money in identifying leading-edge marketing trends	90
•Is positioned at the leading edge of marketing trends and related needs	85
•Has, in the past three years, applied existing solutions in ways not anticipated by suppliers	61
Embedded Ties (Rindfleisch and Moorman 2001)	
Please indicate to which extent the following statements are an accurate reflection of the nature of the relationship	
•Our new product development team members share close social relations with the new product development team members from the customer	62
•The relationship with our customer can be defined as "mutually gratifying "	74
•We expect that we will be working with our customer in the future	67
•We feel indebted to our customer for what they have done for us [a]	
Relationship Length	
How many years have you worked with this customer?	
Relationship Formalization (Sivadas and Dwyer 2000)	
Please indicate to which extent you agree with the following statements regarding the joint NPD project	
•We rely extensively upon contractual rules and policies in controlling day-to-day operations of the relationship with our partner	Formative scale
•We follow written procedures in most aspects of business in the relationship with our partner	
Customer Relationship-Specific Investments (Rokkan, Heide, and Wathne 2003)	
Please indicate the extent to which you agree with the following statements about your partner	
•Significant investments in equipment dedicated to the relationship with our company have been made	72
•Extensive internal adjustments have been made by our partner in order to deal effectively in the relationship	62
•Training people to deal with our company in the relationship has involved substantial commitments of time and money	95
•The logistics systems have been tailored to meet the requirements of dealing with our company in the relationship	71

APPENDIX
Continued

Constructs and Items	Factor Loadings
Supplier Financial Performance (Moorman 1995)	
Please rate the extent to which the product has achieved the following outcomes during the first 12 months of its life in the marketplace	
•Market share relative to its stated objective	90
•Sales relative to its stated objective	89
•Return on assets relative to its stated objective	92
•Profit margin relative to its stated objective	79
•Return on investment relative to its stated objective [a]	
Supplier Strategic Advantage (Jap 1999)	
Please indicate the extent to which you agree with the following statements about your company	
•This innovation relationship has not resulted in strategic advantages for our firm (R)	82
•Our firm has gained benefits that enable us to compete more effectively in the marketplace	64
•This innovation relationship has not resulted in strategically important outcomes for our firm (R)	84
Customer Dependence (Johnson and Sohi 2001)	
Please indicate what applies to your situation (Dummy codes appear between brackets)	
•Compared to our firm, our customer is smaller than our firm (0) our customer is bigger or equal in size (1)	
Market Turbulence (Jaworski and Kohli 1993)	
Please indicate the extent to which you agree with the following statements concerning the industry of the new product developed	
•Customers' product preferences change quite a bit over time	86
•Our customers tend to look for new products all the time	86
•We are witnessing demand for our products and services from customers who never bought them before	62
•New customers tend to have product-related needs that are different from those of our existing customers	60
•We cater to many of the same buyers that we used to in the past (R)[a]	
Technological Turbulence (Jaworski and Kohli 1993)	
Please indicate the extent to which you agree with the following statements concerning the industry of the newly developed product	
•The technology in this industry is changing rapidly	82
•Technological changes provide big opportunities in this industry	69
•A large number of new product ideas have been made possible through technological breakthroughs in our industry	62
•Technological developments in this industry are rather minor (R)	70
•It is very difficult to forecast where the technology in this industry will be in the next 2 to 3 years [a]	
Opportunism (Jap 2003)	
How likely is it that your partner would do the following?	
•Be unwilling to accept responsibility	75
•Provide false information	64
•Make false accusations	76
•Expect my firm to pay for more than their fair share of the costs to correct a problem	60
Knowledge Redundancy (item from Rindfleisch and Moorman 2001) (Semantic differential scale)	
Please indicate to which extent the following statements are an accurate reflection of the nature of the relationship	
•Our partner's NPD team members have different knowledge from ours (1) have the same type of knowledge (7)	
Marker Variable (Rindfleisch and Moorman 2001 [semantic differential scale])	
Please rate the degree to which the new product generated with your customer was	
•Far ahead of time goals (1) Far behind of time goals (7)	67
•Slower than the industry norm (1) Faster than the industry norm (7)	77
•Much slower than we expected (1) Much faster than we expected (7)	74
•Slower than our typical product development time (1) Faster than our typical product development time (7)	61

[a] Items deleted during measure purification process

Notes Unless noted, all variables use a seven-point Likert scale (1 = "strongly disagree" and 7 = "strongly agree") (R) = Item is reverse-coded

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Prokriti Mukherji, Alina Sorescu, Jaideep C. Prabhu, & Rajesh K. Chandy

Behemoths at the Gate: How Incumbents Take on Acquisitive Entrants (and Why Some Do Better Than Others)

Corporate acquisitions are a ubiquitous feature of today's business landscape and a widely used means by which large firms enter new markets. As large acquirers swoop in to acquire firms in new markets, they are almost inevitably met with a chorus of concerns about the potential effects of their actions on the markets they enter. What is the actual impact of acquisitive entry by large firms on the strategies and performance of incumbents? How do incumbents reconfigure the way they compete after a behemoth enters their market? The authors focus on an important facet of firms' competitive positions—their product mix—and propose a framework that explains incumbent firms' reaction to acquisitive entry by large firms, as well as the performance implications of these reactions. They test the hypotheses that result from this framework by examining the impact of acquisitive entry across a large number of firms and consumer markets over time. The data cover 839 acquisitions in 583 metropolitan statistical areas in the U.S. banking industry. The results indicate that incumbents are more likely to align their product mix strategy with that of the acquisitive entrant if (1) the incumbent is large, (2) the acquirer's past performance has been strong, and (3) the market served by the incumbent is small. Importantly, how incumbents react has significant performance implications. The authors find that large incumbents that deviate from acquirers' product mix strategy perform better than other incumbents do.

Keywords: market entry, competitive reaction, product mix strategy, acquisitions, strategic aspirations

Browse through any section of a business newspaper, and the odds are high that it will feature news of a corporate acquisition. And more often than not, this news is about yet another acquisition by a corporate behemoth. Corporate acquisitions worldwide number in the tens of thousands each year, and the total price tag of these acquisitions is in the trillions of dollars. Many large firms view acquisitions as a means to enter new markets, and leverage economies of scale. But as acquisitions become more prominent, so do concerns about their effect on incumbents. There is much fear that acquisitive entry by large firms could reduce the ability of incumbents to compete (e.g., Berger et al. 2004; Froeb 2004). For example, small cable operators faced with the threat of acquisition by large cable and satellite companies "paint themselves as mom and pop operators that come under siege when Wal-Mart rolls into town with lower prices and better distribution networks" (Lee 2001, p. C1). In the telecommunications industry, Wilson (2005, p. 16) notes that "SBC [now AT&T] and its fellow behemoths have squashed the life out of dozens of small, promising service providers developing innovative, low-cost services."

The prevalence of behemoth entry has spurred a significant and growing literature on the effects of such entry on incumbent firms. A particular focus—especially in marketing and economics—has been on entry by Wal-Mart and on incumbents' performance following entry by a large competitor (Basker 2005; Gielens et al. 2008; Hausman and Leibtag 2007; Jia 2005; Singh, Hansen, and Blattberg 2006). A much smaller and more recent literature has also examined incumbents' reactions to such entry (Ailawadi et al. 2010). Despite the contributions of the existing literature

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and the fact that insights from it are used widely by managers and policy makers, we still lack insights into the *determinants* of reactions to entry Specifically, while evidence suggests that there is substantial variance in incumbents' reactions and performance following entry, explanations for such variation remain elusive For example, a recent paper on the topic concludes that "it is difficult to explain variation in [incumbent] reactions" (Ailawadi et al 2010, p 591) Yet, as these authors emphasize, "reactions matter they significantly influence the [performance] of incumbents "

A reason for the difficulty in explaining variation in incumbent reactions might be that existing explanations often rely on classical models of competition, which assume that incumbents behave rationally However, such reasoning may only partly explain reactions by incumbent managers Managers, being all too human, may also be susceptible to other, more psychological factors (e g , Chatterjee and Hambrick 2007), and predictions that address these factors may diverge from those based on simple economic models A second reason for the difficulty in explaining variation in incumbent reactions might be that existing research tends to focus on reactions to a single behemoth Wal-Mart, in particular, has been the focus of a substantial volume of research (see Ailawadi et al 2010) However, different characteristics of behemoth acquirers and the markets in which they enter, which cannot be comprehensively studied in research that focuses on a single entrant, may lead to significantly different reactions to acquisitive entry

A third possible reason for the difficulty in explaining variation in incumbent reactions is that existing research tends to focus on a limited set of incumbents Indeed, a stumbling block for research on the impact of behemoths' entry has been the limited availability of marketwide, objective data Because few mom-and-pop stores make financial information publicly available, researchers face many obstacles in assessing, in a comprehensive and bias-free manner, the impact of behemoth entry on incumbents in a market Existing multifirm studies tend to focus on stock prices or market shares (Froeb 2004, Gielens et al 2008) [1] A focus on the stock prices of public firms may lead to inaccurate inferences about the effects of acquisitive entry on small firms, many of which are private A focus on market share may also be similarly inadequate As the Federal Trade Commission (2003, p 2) notes, "Market share and concentration data provide only the starting point in analyzing the competitive impact of a merger" Perhaps most important, these limited analyses often yield widely varying conclusions

In this article, we propose a framework to further explain variation in incumbents' reactions and performance following acquisitive entry This framework, which is based on the concept of strategic aspirations, brings together insights from corporate strategy, social psychology, and marketing to study (1) how the nature of the incumbent, the acquisitive entrant, and the market explain variation in incumbents' product mix reactions to entry and (2) how such variation in reaction drives incumbents' performance following acquisitive entry by behemoths

We test the predictions from this framework on a unique, large-scale data set from an industry that involves more than $1 trillion in annual transactions the U S commercial banking industry This industry is an important exception to the data difficulties that hobble much of the research on the impact of acquisitions In this industry, information on a wide variety of strategic variables is reported regularly, as required by law As such, we are able to obtain information on variables of interest for all incumbent firms—small and large, public and private Our data include 4614 incumbent banks in 583 U S metro areas from 1995 to 2003 The banking industry has also been the arena of a spate of mergers and acquisitions (M&As) involving assets in the trillions of dollars in total since the early 1990s [2] Therefore, the banking industry provides a particularly appropriate context in which to test our ideas [3]

Classical economic models suggest that the best course of action for incumbents faced with entry by a large, resource-rich competitor is to differentiate themselves from the entrant on the products they offer to customers (e g , Mazzeo 2002) However, many incumbents do not differentiate, indeed, they seek to be more like the entrant in the products they offer to customers (Haveman 1993) The theoretical arguments we present in this article offer an explanation for the frequent examples of imitative reactions encountered in the marketplace Specifically, we argue that the reactions of incumbent firms are driven by their managers' aspirations This aspiration-based framework points to specific incumbent, acquirer, and market characteristics that can explain variability in the similarity between incumbents' and the entrant's postacquisition product mix strategy These reactions have significant performance consequences for incumbents Our results suggest that incumbents that deviate from acquirers' product mix strategy perform the best The finding that managers of some firms choose to imitate large entrants rather than differentiate from them, combined with the finding that those that differentiate do better, suggests that managers could gain from resisting their inherent aspirations

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[1] A considerable research stream has also examined the impact of acquisitions on the performance of the acquirers and targets themselves This research tends to find that acquisitions are, at best, break-even endeavors for acquiring firms, although they tend to yield positive returns to target firms (for a review, see King et al 2004) As such, several scholars have examined how management hubris as well as misaligned management motives on the part of acquiring firms might explain the relatively poor performance of acquiring firms (e g , Agrawal, Jaffe, and Mandelker 1992, Roll 1986) The research on the performance of acquirers and targets rarely examines, as we do in this article, the impact of acquisitive entry on the performance of *other* players in the markets

[2] Indeed, in this industry, as in many others (Sharma 1998), acquisitive entry has been by far the most frequent mode of entry into new markets, perhaps because such entry gives entrants immediate access to a local customer base More than 93% of all new entries by large firms during the period we study were through acquisitions Given the magnitude and importance of this phenomenon, and the controversy surrounding its consequences, this article focuses on acquisitive entry rather than on entry in general As noted subsequently, we control for the extent of nonacquisitive entry in our empirical analysis

[3] Of course, the unique nature of the banking industry suggests that some caution is warranted when generalizing from this industry to others

The focus of this article is on incumbent reactions in the form of their product mix strategies Specifically, we examine how incumbents align their product mix strategies with those of the acquisitive entrant two (respectively three) years after entry, as well as the performance consequences of these changes in product mix strategies Of course, competitors can also react through other elements of the marketing mix (Carpenter and Nakamoto 1990, Hauser and Shugan 1983) We focus on product mix reactions because prior research has suggested that responses to competitive actions tend to be reciprocal—that is, product reactions for product actions, price reactions for price actions, and so forth (Axelrod 2002, Bowman and Gatignon 1995) Such reciprocal reactions have been documented across industries For example, Kuester, Homburg, and Robertson (1999) find that 81 2% of competitors that reacted to new products did so with actions on the product dimension Given our interest in examining how aspirations drive incumbent reactions, the product mix provides a clean yet important dimension on which these reactions are manifested Restricting our study to product mix reactions also has practical benefits Given the large number of markets we cover, and given our interest in the actions of all incumbents—large and small—in each market, data on nonproduct reactions by each incumbent in each market are extremely difficult to obtain and, more importantly, not available for all firms Because nonproduct reactions are not central to our thesis, the incremental insights from such a data collection exercise would not be commensurate with the loss in data completeness

A Theory of Strategic Aspirations

How do incumbent firms react to acquisitive entry by large firms? What impact do incumbents' reactions following such entry have on their subsequent performance in the market? Why do some incumbents do poorly while others do well? Few existing theories address these questions In this section, we propose a theoretical framework that provides some unique responses to these questions This framework takes the perspective of the managers of incumbent firms and is an attempt to understand their cognitive and behavioral reactions to acquisitive entry The theoretical framework integrates three important concepts that have largely existed in isolation—the psychological concept of social comparison (e g , Lockwood and Kunda 1997, Mussweiler 2003), the corporate strategy concept of strategic groups (e g , Fiegenbaum and Thomas 1995), and the marketing concept of product mix strategies (e.g , Grashof 1970, Jank and Kannan 2005, South and Oliver 1992)—to identify a series of hypotheses on the impact of acquisitive entry on marketplace outcomes

Social Comparison

A fundamental tenet of the social comparison literature is that "human judgment is comparative in nature" (Mussweiler 2003, p 472) and that "striving for superiority is a central human motivation" (Mussweiler, Gabriel, and Bodenhausen 2000, p 398) Thus, managers are likely to routinely make comparisons between themselves, the members of the groups they belong to, and other social groups Managers are particularly inclined toward making upward social comparisons, or comparisons to groups that are, in some way, superior to their own (Collins 1996, Lockwood and Kunda 1997) These comparisons act as the basis for the aspirations that motivate behavior When the focus of such comparisons appears within reach, the reference group becomes an aspirational group, and managers will seek to emulate its actions (e g , Baum and Dahlin 2006, Escalas and Bettman 2003) Conversely, when the focus of comparisons appears beyond reach, the reference group becomes a dissociative group, and managers will seek to avoid being associated with it (e g , Lockwood 2002, White and Dahl 2006)

Strategic Groups

The literature on strategic groups (McGee and Thomas 1986) highlights the competitive context in which incumbents operate and from which they make strategic decisions A significant stream of research in this domain has established that groups of firms develop shared beliefs, structures, practices, and strategies as a result of the cognitions and interactions of their organizational members (e g , Porac and Thomas 1990, Reger and Huff 1993) In addition, this literature suggests that managers within an industry classify the firms they manage as well as the competitive landscape in which they operate along dimensions of strategic relevance, such as size, resources, market position, or performance (Armstrong and Collopy 1996, Debruyne and Reibstein 2005) This classification, which serves to simplify the competitive landscape, results in managers viewing their firm as belonging to one of a few strategic groups within an industry Their strategic group then acts as a reference point that informs and drives managers' strategic decisions, such as what product mix to offer to their customers (e g , Armstrong and Collopy 1996, Peteraf 1993)

However, managers are unlikely to remain satisfied with the membership in their current strategic group for an extended period of time Attempts to move across groups are particularly likely following a shock to the market such as that created by the acquisitive entry of a large firm Large, resource-rich entrants may serve as new reference points for incumbents' strategies To the extent that the entrant's position appears within reach, managers of some incumbent firms will seek to emulate the entrant However, other managers may seek to dissociate their firms from the entrant and use their differentiating characteristics and strategies to strengthen or even redefine their market position (Garcia-Pont and Nohria 2002, Greve 1998) In summary, acquisitive entry has the potential to reshuffle strategic groups in the market, either by creating new strategic groups or by realigning existing ones

Product Mix Strategies

The final element in our theoretical framework is drawn from the literature on product mix strategies Two streams in this literature are relevant to our research First, there is strong analytical and empirical evidence that a firm's product mix is shaped by competitive entry (e g , Brander and Eaton 1984, Grashof 1970, Mazzeo 2002, Watson 2009) However, while some authors suggest that differentiation is the best response to entry by large, resource-rich competitors (e g , Mazzeo 2002), others find evidence of a more complex relationship between competitive entry and product mix decisions (see Watson 2009) Second, a growing body of research documents changes in product mix following M&As (e g , Krishnan, Joshi, and Krishnan 2004, Sweeting 2010) Taken together, findings from these streams suggest that a behemoth acquirer's product mix strategy should be a very salient reference point for incumbents

Different factors are likely to influence how managers perceive and respond to entry by behemoths Three factors are particularly relevant in predicting the pattern of reactions (1) incumbents themselves, (2) the behemoths that enter, and (3) the markets in which the incumbents and behemoth entrants interact We now present hypotheses on each of these three factors

Incumbents' Reactions to Acquisitive Entry: The Size of the Incumbent Matters

Whether managers aspire to associate or dissociate themselves from the new entrant depends on the extent to which the new entrant appears to be within or beyond their competitive reach In turn, this depends on the market positions of incumbent firms relative to those of the new entrant Because our focus is on behemoths, the entrant will, by definition, be larger and more resource rich than most incumbents in the market Thus, while all incumbents' managers may compare their market position to that of the entrant, managers of large incumbents are more likely to conclude that the entrant is within their reach For these managers, aspirations of similarity will dominate their comparisons, and they will aspire to associate their firms with a new strategic group redefined around the entrant In contrast, managers of small incumbents are likely to conclude that the entrant's market position is beyond their reach, for these managers, aspirations for divergence will lead them to disassociate their firms from the strategic group centered on the entrant

Our framework also suggests that this tendency to aspire to associate or dissociate will be reflected in strategic decisions Specifically, once managers of incumbent firms have identified their new strategic group, this new group will act a reference point and drive their subsequent strategic decisions, in particular, product mix decisions Because managers of large incumbents are more likely to associate their firms with the large entrant, they are likely to move their product mix strategy in a direction that mirrors that of the entrant, over and above their baseline strategy before the entry of the large entrant In contrast, because managers of small incumbents are more likely to dissociate their firms from the large entrant, they are more likely to restructure their product mix strategy away from that of the entrant, beyond their baseline strategy before the entry of the large entrant Thus

> H_1 In response to entry by large acquirers in an incumbent's market, the larger the incumbent, the more similar the incumbent's product mix is to that of the acquisitive entrants

Incumbents' Reactions to Acquisitive Entry: The Performance of the Acquirer Matters

Aspirations to emulate a competitor can be rooted in perceptions of similarity but may also arise from the perceived attractiveness of that competitor's market position As they examine the market position of a behemoth that has just entered their market, managers of incumbent firms may be more likely to aspire to be similar to a well-performing acquirer The performance record of the acquisitive entrant is just as likely as its size to contribute to the reshuffling of managers' perceptions of strategic group membership and thus influence the strategic changes they will implement in reaction to entry How do managers of incumbent firms react to acquirers with a record of high performance? Conventional economic theories of competitive reaction (e g , Hauser and Shugan 1983, Porter 1980) suggest that they will seek to avoid head-on competition because these high-performing entrants will be formidable competitors in a head-to-head matchup offering similar products

In contrast, our aspiration-based framework makes the opposite prediction Our framework suggests that aspirations to belong to a specific group may also be driven by how attractive the members of a group are perceived to be Entrants with a record of high performance will appear more competent, knowledgeable, and worthy of emulation Thus, managers of incumbents faced with acquisitive entry by successful behemoths will tend to want to imitate such entrants Those faced with entry by less successful behemoths will not view such entrants as being particularly attractive and therefore will be less likely to want to imitate them

For these reasons, ceteris paribus, we predict that incumbents faced with acquisitive entrants that are high performers will be likely to adapt their product mix strategies to be more similar to those of the acquirers

> H_2 In response to entry by large acquirers in an incumbent's market, the better the preacquisition performance of the acquirer, the more similar the incumbent's product mix will be to that of the acquisitive entrants

Incumbents' Reaction to Acquisitive Entry: The Size of the Market Matters

Faced with the acquisitive entry of a behemoth, managers of incumbents are likely to respond differently depending on the size of the market in which they operate How are managers of incumbent firms in small markets likely to react relative to those in large markets? As we argued previously, conventional theories of competitive reaction (e g , Porter 1980) suggest that managers of incumbent firms will seek to avoid head-on competition with entrants in smaller markets because large entrants will be even more formidable competitors in such markets Specifically, in smaller markets, large entrants can more easily employ their superior resources to attract customers away from incumbents that go head-to-head with them in terms of their product mix strategies

In contrast to conventional theories of competition, our aspiration-based framework makes the opposite prediction. Our framework suggests that managers of incumbent firms aspire to imitate large entrants, and this tendency is exacerbated in the context of small markets. In small markets, large entrants loom larger and thus become more prominent targets of emulation for managers of incumbent firms. A big fish will make a bigger splash in a small pond. In addition, in small markets, there is less room for differentiation, because the acquirer decided to enter despite the market size, it must be confident that its product mix strategy is uniquely appropriate for that market's limited customer base. For all these reasons, we argue that incumbents faced with large acquisitive entrants in small markets will adapt their product strategies to be more similar to those of the acquirers than entrants in large markets:

> H_3: In response to entry by large acquirers in an incumbent's market, the smaller the incumbent's market, the more similar the incumbent's product mix is to that of the acquisitive entrants.

Next, we discuss the performance implications of strategic aspirations and the product mix decisions that follow from them.

Incumbents' Performance Following Acquisitive Entry

Given the pattern of incumbents' reactions to behemoth entry that we noted previously, what is the likely impact of such entry on incumbents' performance? As we argued previously, because entrants tend to be more resource rich than incumbents, existing theory suggests that head-on competition with similar products is likely to hurt the performance of incumbents (Dickson and Ginter 1987; Hauser and Shugan 1983; Porter 1980). In addition, if the incumbent offers products that are similar to those offered by the entrant, customers are more likely to perceive the incumbent as an imitator, with negative consequences for the incumbent's customer acquisition and retention efforts (Barreto and Baden-Fuller 2006). As such, both large and small incumbents that differentiate their product offerings from these of the entrants may do better than incumbents that do not. We predict, however, that *large* incumbents are best positioned to benefit from this differentiation strategy. Specifically, the superior resources of large incumbents that differentiate will enable them to compete better against the smaller incumbents that do so. Thus:

> H_4: Following entry by large acquirers, larger incumbents that differentiate their product strategy from that of the acquirer perform better than other incumbents.

Taken together, our four hypotheses argue that incumbents' product mix strategies following an acquisition depend on acquirer, incumbent, and market characteristics and that incumbents' choice of product mix strategy has important performance consequences. Next, we present an empirical study that tests the hypotheses and assesses how the choice of product mix strategies explains the performance of incumbents following acquisitive entry.

Method

Empirical Context

An ideal empirical context to test our hypotheses should have the following features: (1) significant M&A activity, (2) comprehensive data on acquirers and incumbents across large, public as well as small, privately held firms, (3) objective measures of product mix strategies that can discriminate between alternative strategies, (4) objective and bias-free measures of firm performance, and (5) clearly delineated market boundaries. As we noted previously, the unavailability of objective and comprehensive data on the prevalence and impact of acquisitive entry for a range of entrants and incumbents has prevented systematic research in this area.

We make an initial attempt to overcome these empirical challenges. We test our hypotheses on data from the U.S. commercial banking industry, a context that meets all the previously listed requirements. First, this industry has seen a spate of acquisitions as a result of the Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994 (P.L. 103-328, 108 STAT. 2338), which dramatically loosened restrictions on bank operations across geographic markets. Until the passage of this act, the United States—unique among industrialized countries—severely restricted the extent to which banks could enter new markets (for a review, see Giedemann 2004). A variety of regulations imposed restrictions on intrastate and interstate banking. Independent banks arose to meet the needs of customers in each geographic area, yielding a banking industry with more than 10,000 independent banks nationwide. The Riegle-Neal Act, "by giving banks permission to operate widespread interstate branching networks for basically the first time in U.S. history," dramatically increased entries by banks into new geographic markets (Giedemann 2004, p. 328) with 93% of the entries by large banks being made through acquisitions. Between 1994 and 2003, banking acquisitions grew to $3.1 trillion in assets and $2.1 trillion in deposits (Piloff 2004).

Second, comprehensive financial and M&A data are available for all banks, including small, private ones. Specifically, all banks are required to report, on a quarterly basis, information on financial performance to a variety of agencies, including the Federal Deposit Insurance Corporation (FDIC), the Office of the Comptroller of Currency, and the Federal Reserve. Similarly, banks are required to get regulatory approval before they undertake a merger or an acquisition (Rhoades 1996). This ensures that information on all M&As, as well on all incumbents, big and small, is recorded and available to interested researchers. As a result, the banking industry does not suffer from the dearth of data that has limited the scope of previous research on the impact of acquisitions but offers instead a unique opportunity to study all firms in a given market.

Third, the product mix strategies of all banks can be clearly inferred from the data they report. Banks are required to report sales broken down by the types of services offered. Specifically, banks are required to report data on all types of loans extended as well as data within several types of loans For a manufacturer, this would be the equivalent of reporting sales at the product line level From this disaggregated picture of a bank's revenue stream, we can piece together the bank's product mix strategy It is important to note that although the banking industry is subject to more regulation than others, regulation does not impose any limit on the bank's product mix or in any way constrain the bank's choice of loan size or sector activity (commercial vs real estate)

Fourth, the markets in which banks operate can be clearly delineated using the U S Census Bureau's Core Based Statistical Areas (CBSAs), which refer collectively to Metropolitan and Micropolitan Statistical Areas and capture approximately 93% of the U S population In line with previous research in banking (e g , Avery and Samolyk 2004), we use CBSAs to define the markets in which banks operate and in which acquisitions take place

We focus on entry by large acquirers, rather than other types of entry, for several reasons First, our theoretical framework relies on the idea of upward comparisons with what is perceived to be an attractive market player Large acquisitive entrants are well positioned for such upward comparisons Their significant resource base and their acquired customer base make them a significant threat to incumbents Second, large M&As are arguably among the most salient forms of market entry An executive of an incumbent bank whom we interviewed shortly after the acquisitive entry of Citibank in his market confirmed that Citibank's arrival was greeted with significant apprehension, that the banks were closely watching Citibank's product offerings, and that they were prepared to change their product strategy in response to the changes that Citibank was implementing to the acquired target In contrast, the executive seemed significantly less concerned about de novo entry and suggested that other types of entry were rare in that market Third, as we previously argued, acquisitions are by far the most frequent mode of entry in this industry

Data and Sample

Sample selection We collected, from archival sources, data on variables that measure the performance and product mix strategies of banks At the market, or CBSA, level we collected data on M&A activity, non-M&A market entry activity, start-up activity, and demographic characteristics for each market Table 1 presents an overview of our data and the sources we used

We obtain our sample of acquisitions from the SNL Financial database, which contains comprehensive information on the financial transactions of U S banks We focus on the impact of entry by large acquirers on the actions of

TABLE 1
Variables and Data Sources

Conceptual Variable	Notation	Measured Variable	Data Source
Dependent Variables			
Incumbent–acquirer similarity of product mix strategy	Incumbent–acquirer similarity of product mix strategy$_{i,j,t}$	Max(M) – M, where M = Mahalanobis distance between a set of six types of loans extended by incumbent and acquirer (three types of commercial and industrial loans and three types of loans secured by real estate)	June Call Reports from the FDIC (Schedule RC-C)
Incumbent performance	ROA$_{i,j,t}$	Return on assets	SNL Financial
Independent Variables and Controls			
Incumbent size	Incumbent Size$_{i,t}$	Incumbent's assets	Summary of Deposits from the FDIC
Acquisitive entry	Acquisitive Entry$_{j,t}$	Number of large acquirers entering each CBSA	Summary of Deposits from the FDIC and SNL Financial
Acquirer size	Acquirer Size$_{j,t}$	Average assets of large acquirers entering each CBSA	Summary of Deposits from the FDIC
Acquirer preacquisition performance	Acquirer Preacquisition Performance$_{j,t}$	Weighted average return on assets of large acquirers in the year preceding the acquisition	SNL Financial
Market size	Market Size$_{j,t}$	Total deposits in each CBSA	Summary of Deposits from the FDIC
Start-up activity	Start-up Activity$_{j,t}$	Number of new bank charters in each CBSA	Bank Regulatory Database from WRDS and Summary of Deposits from the FDIC
Nonacquisitive market entry	Nonacquisitive Entry$_{j,t}$	Number of banks entering each CBSA in a nonacquisitive manner	Summary of Deposits from the FDIC
Purchasing power	Purchasing Power$_{j,t}$	Per capita income in each CBSA	U S Census Bureau

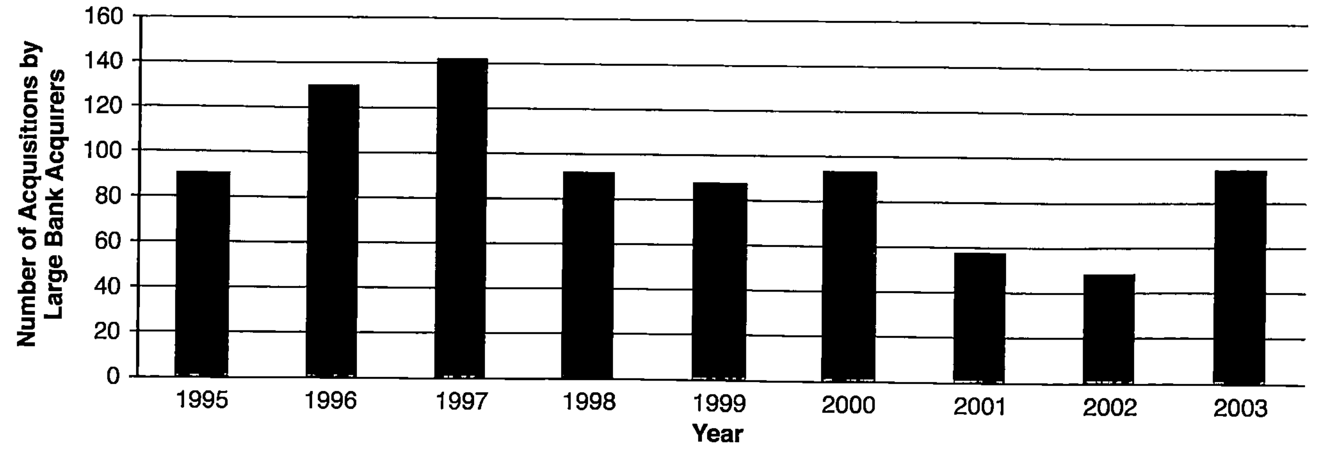
incumbent firms because large (vs small) acquirers are more likely to disrupt the equilibrium when entering a market (Berger et al 1998) In the banking context, large acquisitive entrants are defined as banks with assets greater than or equal to $1 billion (Berger et al 1998, Gilbert and Belongia 1988) We were able to obtain complete data for all the variables included in the study on 839 of the 1096 M&As undertaken by large banks, both public and private, between 1995 and 2003 Our focus on large acquirers enables us to capture a majority of acquisitions because 77% of acquisitions made between 1995 and 2003 were made by large banks Moreover, large acquirers account for 98% of all deposits acquired, which further ensures that our sample is representative of the overall acquisition activity in the U S banking industry Figure 1 shows the distribution of these acquisitions during the 1995–2003 period

The greatest data collection challenge we faced was to create a database of incumbents in each market in which a large acquirer entered between 1995 and 2003 To compile such a database, we aligned each acquisition with all banks operating in the CBSA in which the acquisition took place In essence, this is equivalent to identifying each potential competitor for the acquirer in the market in which it had just entered We did so using data from the Summary of Deposits database, which includes annual deposit reports at the branch level By summing a bank's deposits across all branches in a CBSA, we obtained a measure of the magnitude of its presence in that CBSA for each year in our sample In addition to M&A data, we also collected detailed financial data for all incumbents from the SNL Financial, FDIC, and the Summary of Deposits databases, we collected demographic data at the market level from the 2000 U S Census

The product mix strategies of banks and details on bank lending practices Loans are banks' main source of revenue We focus on the two categories of business loans that commercial banks can extend, which typically constitute a majority of banks' business (1) loans secured by real estate (nonresidential) and (2) commercial and industrial loans Loans secured by real estate include loans backed by real estate as evidenced by mortgages on business and industrial properties, hotels, motels, churches, hospitals, educational and charitable institutions, and similar properties Commercial and industrial loans include loans for commercial and industrial purposes to sole proprietorships, partnerships, corporations, and other business enterprises, whether secured (other than by real estate) or unsecured, single payment, or installment We also included loans to individuals for commercial, industrial, and professional purposes, but not for investment or personal expenditure purposes Summaries of loan activity by type of loan are periodically reported in the banking press because they are considered a crucial determinant of banks' financial performance

Banks are required to report three subcategories of loans secured by real estate (1) secured by construction and land development, (2) secured by multifamily residential properties, and (3) secured by nonfarm nonresidential properties As their names indicate, these types of loans serve different purposes, are typically targeted to different segments, and as such are distinct components of a bank's product mix In addition, banks are required to report the following categories of commercial and industrial loans (1) small (less than $100,000), (2) medium (between $100,000 and $1 million), and (3) large (more than $1 million) As is the case with the subcategories of loans secured by real estate, the three subcategories of commercial and industrial loans are also distinct components of a bank's portfolio of products Indeed, each type is targeted to a different segment of customers For example, large-sized commercial and industrial loans are typically given to large businesses, while small-sized commercial and industrial loans are typically given to small businesses (Berger et al 1998, Levonian and Soller 1996)[4] Furthermore, the characteristics of these segments of customers require substantially different lending practices (Berger et al 1998) Specifically, smaller customers tend to seek small business loans and tend to be more informationally opaque borrowers (Berger et al 1998) In gen-

FIGURE 1
Number of Acquisitions by Large Bank Acquirers (1995–2003)



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[4] In general, banks with assets less than $100 million cannot make loans larger than $1 million without running afoul of Federal Reserve lending guidelines (Berger et al 2001) We explicitly account for this issue in our empirical analysis

eral, lending to such borrowers is a customized process requiring a good knowledge of the local environment rather than a more general process based on a predetermined set of criteria Conversely, larger customers tend to seek large loans and be more informationally transparent borrowers In summary, commercial banking offers a context in which the components of the product mix of each firm can be clearly delineated, and thus product mix strategies can be easily identified and compared across firms

Measures

Our goal is to show how firms' product mix strategies change following acquisitive entry into their markets and how these changes affect their performance Our hypotheses focus on (1) how the size of the incumbent, the preacquisition performance of the entrant, and the size of the market in which the incumbent operates influence the incumbent's emphasis on a product mix that is similar to that of the large entrant and (2) how an incumbent's choice of product mix strategies affects its performance

Hypothesized variables We have six hypothesized variables First, there is the "incumbent–acquirer similarity of product mix strategy" To assess the similarity between the incumbent and the acquirer's product strategy, we begin by computing the Mahalanobis distance in the loan portfolio between the incumbent and the acquirer (Kim and Finkelstein 2009)

For each bank, we construct a vector L_i that captures the composition of its product portfolio This vector captures the emphasis that a bank puts on each of its product lines (i e , each different type of loan it extends) as a percentage of its total loans

$$L_i = \begin{pmatrix} \text{\% real estate loans secured by construction and land development} \\ \text{\% real estate loans secured by multifamily residential properties} \\ \text{\% real estate loans secured by nonfarm nonresidential properties} \\ \text{\% commercial and industrial loans less than \$100,000} \\ \text{\% commercial and industrial loans between \$100,000 and \$1 million} \\ \text{\% commercial and industrial loans over \$1 million} \end{pmatrix}$$

We then compute the Mahalanobis distance between the vector $L_{\text{incumbent}}$ and L_{acquirer} for each incumbent facing an acquisitive entry by a large acquirer in its market, as follows

$$MD = \sqrt{(L_{\text{acquirer}} - L_{\text{incumbent}})^T W^{-1} (L_{\text{acquirer}} - L_{\text{incumbent}})},$$

where W^{-1} is the inverse of the pooled covariance matrix

The multivariate nature of the Mahalanobis distance constitutes an obvious advantage over univariate measures such as simple differences or the Euclidian distance Furthermore, the Mahalanobis distance also accounts for potential correlations between the various types of loans by taking into account the covariance matrix between the six loan types (Kumar, Mahalanobis, and Juday 2005) In substantive terms, it is well suited for our purpose The Mahalanobis distance between the two vectors captures how closely the product strategies of two banks match The more similar the emphasis of the two banks on each type of loan, the smaller is the difference in the percentages of these loans across the two vectors, and the shorter is the Mahalanobis distance Thus, the incumbent–acquirer similarity of product mix strategy increases as Mahalanobis distance decreases Because our theoretical arguments and hypotheses are worded in terms of similarity, we compute the similarity between product mix strategies as follows

$$\text{Similarity}_i = \max(MD) - MD_i,$$

where max (MD) is the maximum Mahalanobis distance across the entire data set This metric captures similarity comprehensively, accounting for alignment in the size of product categories included in the product portfolio, as well as for possible correlations between loan types (Kim and Finkelstein 2009, Kumar, Mahalanobis, and Juday 2005)

Our second hypothesized variable is "incumbent performance " H_4 predicts how an incumbent's emphasis on a certain product mix strategy will affect its performance following the entry of a large acquirer into its market In line with previous research in the banking industry, we use return on assets (ROA) as a measure of performance of incumbent banks (Rose 1987)

Our third variable is "incumbent size " Consistent with previous research, we use a bank's assets to measure its size (Goldberg and White 1998) We expect that the larger the incumbent, the more it will attempt to mimic the acquirer by aligning its product mix strategy to that of the acquirer

Fourth, we have the "preacquisition performance of large acquirers " In line with the performance measure used for the incumbent, we measure the acquirer's preacquisition performance using ROA If more than one large acquirer entered a CBSA in a given year, we used a weighted average (by size) of the performance of all large acquisitive entrants We expect that the more successful the acquirer has been in the recent past, the stronger the incumbent's aspirations are to emulate the acquirer, and the more likely the incumbent is to imitate its product mix strategy

Our fifth variable is "market size " We measure the size of the incumbent's market using the total amount of bank deposits in the incumbent's CBSA (Berger et al 2004) We expect that the smaller the market, the stronger the incumbent's reaction is to the large acquisitive entry in that market, and the more likely the incumbent is to go head-to-head with the acquirer and imitate its product mix strategy

The sixth variable is "acquisitive entry" We measure the extent of acquisitive entry in a given market (CBSA) using the total number of acquisitions made by large acquirers (assets greater than or equal to $1 billion) in that CBSA in each year We expect that the more acquisitions are undertaken in a CBSA, the more likely it is that incumbents will react by updating their product mix strategies

Control variables We also consider four control variables First, we consider "acquirer size " We use the average assets of the large acquirers that entered a CBSA in a given year as a control variable We expect that the larger the size of the acquirers that enter the market, the more likely it is that incumbents will react and change their product mix strategies

Second, we consider "purchasing power" Previous research has indicated that the demographic composition of each CBSA may affect the lending activities that banks perform in that market (e g , Berger, Goldberg, and White 2001) We measure the purchasing power in each CBSA using the per capita income in that CBSA (Amel and Liang 1997)

Third, we consider "start-up activity" We measure the extent of the start-up activity in a market using the number of new bank charters recorded each year in each CBSA Prior research has indicated that acquisitive entry increases the number of new (de novo) bank charters in the market (Seelig and Critchfield 2003) and that de novo charters are more likely to extend certain types of loans (Berger et al 2004, Goldberg and White 1998), thus asymmetrically increasing competitive pressure in some of the product lines included in incumbents' portfolios

Fourth, we consider "nonacquisitive entry activity" We measure the extent of the nonacquisitive entry activity in a market using the number of established banks that entered each CBSA in each year in our sample Banks that opened new branches in a CBSA in which they did not previously do business have the potential to affect the product mix strategies of incumbent firms by increasing concentration in the market We focus on nonacquisitive entries by large banks only, to preserve symmetry with acquisitive entry and to reduce noise in the data, because banks are less likely to react to actions taken by small competitors

Model

The characteristics of our sample and the nature of the relationships we study guided us in choosing the econometric model most appropriate for testing our hypotheses First, we need to allow sufficient time for the effects of acquisitions to materialize Previous research has suggested that it takes approximately three years for an acquirer to complete the restructuring of the target (Focarelli and Panetta 2003, Peek and Rosengren 1998) and for incumbents to adjust to the acquirer's presence in their market (Avery and Samolyk 2004, Berger et al 1998) In addition, this lag reflects the notion that banking relationships are long-standing and that it takes time for a bank to modify its customer base in a manner that would best match the bank's updated product mix strategies As such, we measure the similarity between incumbents' and acquirers' product mix strategies, as well as incumbents' performance, three years following an acquisition in a CBSA We examine the sensitivity of our results to alternative lags of the data subsequently, in the section in which we discuss robustness checks, and find that our results are not sensitive to the three-year lag used

Second, because product mix decisions and performance may be path dependent, we need to account for the effect of past levels of these variables We do so by using a distributed-lag specification (Intriligator, Bodkin, and Hsiao 1996) This specification eliminates the need for multiple lags of the independent variables Furthermore, we account for unobserved heterogeneity among the banks in our sample by adding a firm-specific random effect

Our econometric model contains two recursive equations The first equation models the similarity between the incumbent and the acquirer product mix strategies as a function of their past product mix strategies, size, acquisitive entry, and controls The second equation models incumbents' performance following acquisitive entry as a function of banks' past performance, similarity in product mix strategies, size, acquisitive entry activity, and controls Recursive equations, with the assumption of uncorrelated errors, do not require simultaneous estimation

$$
\begin{aligned}
(1)\ & \text{Incumbent–acquirer similarity of product mix strategy}_{i,j,t+3} \\
&= \beta_0 + \beta_1\text{Incumbent–acquirer similarity of product mix strategy}_{i,j,t+2} \\
&+ \beta_2\text{Incumbent Size}_{i,t} + \beta_3\text{Acquisitive Entry}_{j,t} + \beta_4\text{Incumbent Size}_{i,t} \\
&\times \text{Acquisitive Entry}_{j,t} + \beta_5\text{Acquirer Preacquisition Performance}_{j,t} \\
&+ \beta_6\text{Acquirer Preacquisition Performance}_{j,t} \times \text{Acquisitive Entry}_{j,t} \\
&+ \beta_7\text{Market Size}_{j,t} + \beta_8\text{Market Size}_{j,t} \times \text{Acquisitive Entry}_{j,t} \\
&+ \beta_9\text{Acquirer Size}_{j,t} + \beta_{10}\text{Purchasing Power}_{j,t} \\
&+ \beta_{11}\text{Start-up Activity}_{j,t} + \beta_{12}\text{Nonacquisitive Entry}_{j,t} \\
&+ \nu_t\text{Year Dummy} + \mu_i + \varepsilon_{i,j,t}, \text{ and}
\end{aligned}
$$

$$
\begin{aligned}
(2)\ & \qquad \text{ROA}_{i,j,t+3} = \zeta_0 + \zeta_1\text{ROA}_{i,j,t+2} \\
&+ \zeta_2\text{Incumbent–acquirer similarity of product mix strategy}_{i,j,t+3} \\
&+ \zeta_3\text{Incumbent Size}_{i,t} \\
&+ \zeta_4\text{Incumbent–acquirer similarity of product mix strategy}_{i,j,t+3} \\
&\times \text{Incumbent Size}_{i,t} + \zeta_6\text{Acquirer Size}_{j,t} + \zeta_7\text{Purchasing Power}_{j,t} \\
&+ \zeta_8\text{Market Size}_{j,t} + \zeta_9\text{Start-up Activity}_{j,t} \\
&+ \zeta_{10}\text{Nonacquisitive Entry}_{j,t} + \nu''_t\text{Year Dummy} + \mu''_i + \varepsilon''_{i,j,t},
\end{aligned}
$$

where i stands for firm (bank), j represents market (CBSA), and t is time

These models involve a dynamic panel specification Dynamic models with lagged dependent variables cannot be estimated using ordinary least squares, given the correlation between the lagged dependent variable and the random error term (Baltagi 2008) Instead, they are typically estimated using generalized method of moments (GMM, Arellano and Bover 1995) Usually, for such estimators, the predetermined and endogenous variables in first differences are instrumented with suitable lags of their own levels However, in many instances, these lagged levels of the independent variables are not good instruments Furthermore, the paucity of information in the levels of the variables about the parameters of interest may result in the loss of a substantial part of the total variation in the data (Arellano and Bover 1995, p 48)

To overcome these problems, Arrelano and Bover (1995) and Blundell and Bond (1998) propose a "system GMM" estimator that includes both the differences in and the levels of the predetermined and endogenous variables as instruments Additional instruments for this estimator are the lags of the first difference of the predetermined and endogenous variables The use of these additional instruments renders the system GMM estimator more efficient than the first difference estimator Therefore, we use the system GMM approach proposed by Arrelano and Bover (1995) and Blundell and Bond (1998) and apply the Windmeijer (2005) finite sample correction to estimate the coefficients and standard errors for our model

The use of the system GMM approach has an additional, important benefit when modeling incumbent reactions to acquisitive entry The entry decision by potential acquirers is endogenous—indeed, acquirers do not choose to enter markets randomly, by throwing darts on a map of the United States Rather, they enter on the basis of an assessment of the inherent attractiveness of the market, as well as an assessment of prior entry into the market By using absolute levels as well as first differences of market factors and prior acquisitions as instruments, the system GMM approach accounts for endogeneity in the acquirers' decision to enter a particular market

Results

Descriptive statistics reveal interesting insights into the extent and type of market entry in our empirical context While each CBSA experienced, on average, more than two acquisitions by large acquirers per year, the number of nonacquisitive entries by large banks was far lower, at only approximately 10 per year, on average The number of new charters per year in each CBSA was, on average, also lower than the number of large acquisitive entries (2 40 new charters vs 2 75 entries by large acquirers, on average, per year, per CBSA) These statistics suggest that acquisitions were the most prevalent way large banks entered new markets, perhaps as a result of the Riegle-Neal Act Table 2 presents descriptive statistics on all variables included in the analysis

To further understand our sample, we break it down by type of incumbent and type of market First, recall that in line with the banking literature, we used $1 billion in assets as a cutoff size to identify the large acquirers (Berger et al 1998, Gilbert and Belongia 1988) Using the same cutoff for incumbents yields 231 large and 4220 small incumbents (163 incumbents were close to the cutoff and fall in and out of the "large" category throughout the nine-year period covered in our study) Thus, as we expected, small incumbents constitute a majority, and the threat of entry posed by large acquirers is likely to be significant for most of these firms

Second, we examine the characteristics of the markets in which acquisitive entry took place The distribution of the size of these markets is skewed as well Using the median cutoff yields 820 small and 19 large CBSAs[5] A closer look at the large CBSAs reveals, as expected, a higher level of acquisitive entry While the average CBSA experienced 2 75 entries by large acquirers per year, the largest 19 CBSAs had, on average, 3 25 such entries versus 1 31 entries for the smaller CBSAs We control for the size of the CBSA in our empirical analyses

Third, to gain a better understanding of the product line strategies of incumbent banks, we examine the variance in the loans offered by incumbents, as well as any potential strategy differences between large and small incumbents or incumbents present in small or large markets Table 3 presents a breakdown of the loans used to compute the similarity metric by loan type, incumbent size, and market size The only discernible difference is that large banks extend a higher percentage of commercial and industrial loans of more than $1 million (24 7% vs 9 4%), in line with their larger asset base and better ability to handle such large loans The types of loan extended do not appear to significantly vary by the size of incumbents' home markets[6] Finally, we also examine the temporal variation of the percentages of the different types of loans by taking two-year differences between the types of these loans pre- and postacquisitive entry We find that these differences are in general significantly different from zero, albeit small, indicating that while there is some degree of stickiness in product mix strategies, banks indeed change these strategies and reshuffle their product mixes to adjust to market conditions

The similarity metric that captures the differences in the percentages of six types of business loans exhibits appropriate variance, and it is fairly normally distributed across the sample We also find that similarity in product mix strategy between incumbents and the acquirers that have entered their markets significantly increases, on average, in the three years following the acquisition, offering face validity to our assertion that incumbents align their product mix strategies with those of the incumbents

Tables 4 and 5 present the results of the GMM estimation of Equations 1 and 2 We conduct several checks to confirm the appropriateness of the models we use As we mentioned previously, the system GMM estimator (Arellano and Bover 1995) affords the choice of a large number of instrumental variables that can be used to address concerns about endogeneity (i e , the lags in the levels of the variables and the lags of the first differences) Thus, as the length of the panel increases, the number of instruments available increases, but the instruments used must also be valid (i e , orthogonal to the errors, see Baum and Schaffer 2002) We check for instrument validity using the Hansen J statistic (Hansen 1982, see also Baum and Schaffer 2002). In our estimations, the *p*-values for the Hansen test of overidentifying restrictions are nonsignificant, indicating that the null of orthogonality of instruments and errors cannot be rejected at the 5% level, and thus the instruments we use are valid

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[5] The large CBSAs are Chicago-Naperville-Joliet, Providence-New Bedford-Fall River, San Francisco-Oakland-Fremont, Los Angeles-Long Beach-Santa Ana, New York-Northern New Jersey-Long Island, Boston-Cambridge-Quincy, Pittsburgh, Charlotte-Gastonia-Concord, Philadelphia-Camden-Wilmington, Cleveland-Elyria-Mentor, Stockton, Minneapolis-St Paul-Bloomington, Atlanta-Sandy Springs-Marietta, Birmingham-Hoover, Salt Lake City, Cincinnati-Middletown, Dallas-Fort Worth-Arlington, Detroit-Warren-Livonia, and Washington-Arlington-Alexandria

[6] We also estimated our two main models using this similarity measure for each type of loan using the same method used in the study We were not able to identify any patterns that would suggest that one type of loan is likely to be more prone to alignment with the acquirer's strategy

TABLE 2
Descriptive Statistics

	M	SD	Correlation Matrix					
			1	2	3	4	5	6
1 Similarity of product mix strategies$_{i,j,t+3}$	37 160	1 902	1					
2 ROA$_{i,j,t}$	942	1 330	032	1				
3 Incumbent Size$_{i,t}$	8 58 × 10^{8}	10 27 × 10^{9}	045	010	1			
4 Acquisitive Entry$_{j,t}$	2 755	2 257	− 135	− 008	− 012	1		
5 Acquirer Size$_{j,t}$	11 47 × 10^{11}	13 28 × 10^{10}	− 045	− 028	015	385	1	
6 Market Size$_{j,t}$	6 97 × 10^{10}	10 64 × 10^{10}	− 154	− 051	096	325	031	1
7 Acquirer Preentry Performance$_{j,t}$	017	062	− 065	000	011	056	− 105	079
8 Nonacquisitive Entry$_{j,t}$	107	332	018	− 010	− 006	− 051	− 063	110
9 Purchasing Power$_{j,t}$	29,612	5873	− 139	− 050	035	251	117	488
10 Start-up Activity$_{j,t}$	2 402	3 105	− 147	− 041	− 012	390	154	331

TABLE 3
Descriptive Statistics on the Type of Loans Extended by Incumbents: Percentage Loans by Incumbent and Market Size

Type of Loan	Loan Percentage Across Entire Sample[a] N = 15,051	Incumbent Bank Size: Small (Less Than $1 Billion in Assets) N = 13,994	Incumbent Bank Size: Large ($1 Billion or More in Assets) N = 1139	Market Size: Small (Below Median Deposits) N = 4692	Market Size: Large (Above Median Deposits) N = 10,441
Loans secured by real estate construction, land development, and other land loans	11 99%	12 10%	10 65%	12 80%	10 18%
Loans secured by real estate secured by multifamily (five or more) residential properties	4 60%	4 36%	7 54%	3 66%	6 71%
Loans secured by real estate secured by nonfarm nonresidential properties	36 73%	37 02%	33 19%	36 12%	38 10%
Commercial and industrial loans smaller than $100,000	6 42%	6 66%	3 36%	6 85%	5 45%
Commercial and industrial loans between $100,000 and $1 million	11 58%	11 83%	8 59%	11 26%	12 31%
Commercial and industrial loan greater than $1 million	10 68%	9 54%	24 71%	11 20%	9 51%

[a] All loan percentages are calculated relative to the sum of the loans included in the analysis Other types of loans that certain banks may extend, but are not commonly extended by all banks, such as loans secured by farmland, loans to finance agricultural production, or loans to foreign governments and officials, are excluded

TABLE 4
Similarity in Product Mix Strategies

	Incumbent–Acquirer Similarity of Product Mix Strategy$_{i,j,t+3}$	
Intercept	7 73	(3 99)
Incumbent–acquirer similarity of product mix strategy$_{i,j,t+2}$	73**	(11)
Incumbent Size$_{j,t}$	$-1\ 47 \times 10^{-9}$	$(3\ 26 \times 10^{-9})$
Acquisitive Entry$_{j,t}$	–1 55**	(48)
Incumbent Size$_{j,t}$ × Acquisitive Entry$_{j,t}$	$3\ 59 \times 10^{-9}$**	$(9\ 59 \times 10^{-10})$
Acquirer Preacquisition Performance$_{j,t}$	–20 34**	(5 21)
Acquirer Preacquisition Performance$_{j,t}$ × Acquisitive Entry$_{j,t}$	20 18**	(5 21)
Market Size$_{j,t}$	$-1\ 45 \times 10^{-9}$	$(2\ 07 \times 10^{-9})$
Market Size$_{j,t}$ × Acquisitive Entry$_{j,t}$	$-1\ 21 \times 10^{-9}$**	$(3\ 25 \times 10^{-10})$
Acquirer Size$_{j,t}$	$2\ 20 \times 10^{-9}$*	$(9\ 93 \times 10^{-10})$
Purchasing Power$_{j,t}$	26**	(08)
Start-up Activity$_{j,t}$	– 008	(05)
Nonacquisitive Entry$_{j,t}$	– 98**	(40)
Wald χ^2	206 51**	

*$p < 05$
**$p < 01$
Notes Standard errors are listed in parentheses Coefficients of year dummies are excluded for brevity

It is important to note that all our models account for firms' product mix strategies before entry If our results indicate that some incumbents emphasize certain strategies, our lagged variable approach suggests that they do so beyond their preacquisition propensity to emphasize such strategies Thus, our results cannot be attributed to firm inertia in product mix strategies but rather reflect significant changes implemented by firms following acquisitive entry

Questions may also arise about the magnitude of the change in product mix strategy If the acquirer does not change the product mix strategy of the acquired bank, there should not be a change of equilibrium in the market, and there is little impetus for the incumbent to make any changes to its product strategy In studying the industry and as a result of several interviews with banking executives involved in acquisitions, we learned that the strategies of acquired banks do change in line with the identities of the acquirers In a vast majority of cases, the charters (and thus the identities) of target banks are replaced by those of the acquirers Behemoths, in particular, rely on economies of scale and expect the target to quickly align with their product mix strategies and lending policies Thus, the acquirer's strategy becomes the new benchmark for the incumbent The magnitude of the change will indeed depend on how

TABLE 5
Incumbent Performance Following Acquisitive Entry

	$ROA_{i,j,t+3}$	
Intercept	3 54*	(1 65)
$ROA_{i,j,t+2}$	24*	(13)
Incumbent–acquirer similarity of product mix $strategy_{i,j,t+3}$	– 063*	(03)
Incumbent $Size_{i,t}$	$2\ 25 \times 10^{-7}$*	$(1\ 28 \times 10^{-7})$
Incumbent–acquirer similarity of product mix $strategy_{i,j,t+3}$ × Incumbent $Size_{i,t}$	$-7\ 80 \times 10^{-9}$*	$(3\ 85 \times 10^{-9})$
Acquisitive $Entry_{j,t}$	– 027	(027)
Acquirer $Size_{j,t}$	$1\ 60 \times 10^{-10}$	$(3\ 59 \times 10^{-11})$
Purchasing $Power_{j,t}$	012	(02)
Market $Size_{j,t}$	$-1\ 45 \times 10^{-10}$	$(9\ 83 \times 10^{-11})$
Start-up $Activity_{j,t}$	052**	(020)
Nonacquisitive $Entry_{j,t}$	– 36**	(13)
Wald χ^2	3523 64**	

$*p < 05$
$**p < 01$
Notes Standard errors are listed in parentheses Coefficients of year dummies are excluded for brevity

close they were at the time of the acquisition, but we control for that starting point through our lagged dependent variable

Tests of Hypotheses

Incumbents' reactions following acquisitive entry similarity in product mix strategies H_1 predicts that in response to entry by large acquirers, large incumbents seek to become more similar to the entrants in their product strategy than other incumbents Our results provide support for H_1 (see Table 4) The coefficient of the interaction term between acquisitive entry and incumbent size is positive and significant ($\beta_4 = 3\ 59 \times 10^{-9}, p < 01$), implying that the greater the extent of acquisitive entry and the larger the incumbent, the more similar incumbent's product mix strategy is to that of the acquisitive entrant The coefficient of the lagged dependent variable (i e , the past similarity in product mix strategy) is also significant and positive ($\beta_1 = 73, p < 01$), confirming the intuitive assertion that a bank's product mix strategies are path dependent H_2 predicts that in response to entry by large acquirers in an incumbent's market, the better the preacquisition performance of the acquirer, the more similar the incumbent's product strategy is to that of the acquisitive entrants The coefficient of the interaction term between acquisitive entry and the preacquisition performance of the acquirer is positive and significant ($\beta_6 = 20\ 18, p < 01$)

H_3 predicts that in response to entry by large acquirers in an incumbent's market, the smaller the incumbent's market, the more similar the incumbent's product mix strategy is to that of the acquisitive entrants The coefficient of the interaction term between acquisitive entry and the size of the market is negative and significant ($\beta_8 = -1\ 21 \times 10^{-9}$, $p < 01$)

Furthermore, we find that a high income per capita in a CBSA is associated with greater similarity between the incumbent and the acquisitive entrant's product mix strategies ($\beta_{10} = 26, p < 01$), and a greater extent of nonacquisitive entry is associated with a lower similarity between incumbent and acquisitive entrant's strategies ($\beta_{12} = -98$, $p < 01$) Finally, both the Hansen test for overidentification of restrictions and the Arellano–Bond test for autocorrelation on the residuals in first differences (AR(2)) are nonsignificant, indicating that the instruments used to estimate the model are adequate

Incumbent performance following acquisitive entry H_4 predicts that in response to entry by large acquirers, the less similar the incumbent's product strategy is to that of the acquirer and the larger the incumbent, the better is the incumbent's performance We find support for this hypothesis The coefficient of the interaction between incumbent size and similarity in product strategy between incumbent and acquirer is significant and negative ($\zeta_4 = -7\ 80 \times 10^{-9}$, $p < 05$) These results suggest that large incumbents' propensity to closely mirror a large acquisitive entrant's product strategy is ill-advised, and divergence from this strategy leads to the best performance In this context, aspirations to emulate the entrant do not result in a better performance

The results in Table 5 also show that the coefficient for lagged ROA is positive and significant ($\zeta_1 = 24, p < 01$), the number of new charters in the CBSA is positively associated with incumbent ROA ($\zeta_9 = 052, p < 01$), and the number of large nonacquisitive entrants is negatively associated with performance ($\zeta_{10} = -36, p < 01$) As was the case with the first equation, both the Hansen test for overidentification of restrictions and the Arellano–Bond test for AR(2) in first differences are nonsignificant, indicating that the instruments used to estimate this model are adequate

Alternative Explanations, Robustness Checks, and Additional Analysis

Does inertia provide an alternate explanation for our results? A skeptical reader may argue that our results can be explained by simple inertia Large banks, whether they are incumbents or acquirers, emphasize similar loans in their portfolios, and thus their product strategies appear to be similar Note, however, that our analyses control for the effects of inertia, and our results are beyond any effects we might expect as a result of firms' past strategies First, as we noted previously, our dynamic panel approach assesses behaviors beyond those that would arise from firms' baseline tendencies to behave a certain way. Second, we find that, on average, the similarity between incumbents and acquirers increases following the acquisition, suggesting that the product mix strategies of firms are not static and are restructured in response to competitive threats.

Does differentiation provide an alternate explanation for our results? Another argument that could be made is that our results simply show that differentiation is a more profitable strategy than imitation—that is, firms that follow a differentiation strategy in response to acquisitive entry will perform better than others. We believe that we provide a more nuanced view on differentiation. First, our framework makes systematic, theoretically based predictions about which firms are likely to diverge and which ones will aspire to be similar. Second, we show that differentiation affects firms differently; firms that are most similar to the acquisitive entrant (i.e., large firms) are actually hurt most if they fail to differentiate. Thus, although differentiation could explain one of our four hypotheses, it does not provide an overarching alternative explanation to our results.

Are our results sensitive to the three-year lag used? Our results are based on estimations that use a three-year lag following acquisition to measure incumbents' emphasis on customers that are similar to or different from those that the entrant targets as well as to measure incumbents' performance. To test whether these results are robust to other specifications of the lagged effects of acquisition, we reestimate Equations 1 and 2 using a two-year rather than a three-year lag for customer-targeting strategies and performance. The results of this analysis are similar to those reported previously, suggesting that our results are not sensitive to the three-year lag used.

How robust are our results to the assumption that incumbents are smaller than entrants? An implicit assumption behind our conceptual arguments and empirical analysis is that even the largest incumbents are likely to be smaller than entrants in any given market. However, if this assumption does not hold for some incumbents in certain markets, it is likely that these incumbents will not be as vulnerable to changes brought about by acquisitive entry as their smaller counterparts will. To determine the robustness of our findings to this possibility, we examined whether any of the incumbents in our sample have assets greater than the acquirers that enter their markets. We found only 102 such incumbents, which account for a mere 2.2% of the banks in our sample. To rule out any potential confounding effects of using these banks in our estimation, we repeated our analysis on a subsample that excludes these observations. In general, the results of this additional analysis are consistent with the results presented previously. Alternatively, we also estimated our models on a subsample that includes only the incumbents that have 50% of their deposits in one CBSA, arguably the ones that are the most affected by the acquisitive entry, and we find that the results are consistent with the ones from the full sample.

How sensitive are our results to the inclusion of markets in which many large banks have headquarters? It is possible that in markets in which many large banks are headquartered, incumbents already have product mix strategies that reflect the presence of these large banks. Additional entry by large acquirers in such markets may not cause as large a disruption to the market equilibrium as it would in markets with a lower presence of large banks. To check whether our results are robust to the exclusion of the markets with the largest number of large banks, we first sort all markets on the basis of the number of large banks headquartered in them. A scree plot reveals that nine CBSAs stand out as having the largest number of large bank headquarters. We find that dropping these nine CBSAs yields results consistent with those reported previously. Although the significance of some results becomes marginal due to a large reduction in sample size, we nevertheless conclude that the results reported in Tables 4 and 5 do not rely on the inclusion of markets in which many large banks have headquarters. As an additional robustness check, we also estimated alternative models by dropping, in a similar way, the largest CBSAs as measured by the total deposits held by banks in these markets. Again, the results are consistent with those reported in Tables 4 and 5.

Summary and Discussion

Acquisitive entry by large firms can cause anxiety among incumbents in the targeted market. Such entrants represent a shock to the competitive equilibrium in incumbents' markets. This shock prods many incumbents to react to the entry. However, the reactions differ and so do the payoffs. This research represents an early effort to understand why some incumbents react and perform differently from others when behemoths arrive at their gates. By combining insights from social psychology, corporate strategy, and marketing, we develop a framework that attempts to explain the varying reactions and performance outcomes of incumbent firms confronted with entry by large firms. We emphasize the importance of a key marketing decision—the incumbent's product mix strategy—in driving the reactions and performance of firms.

Moreover, our framework makes predictions that differ from those of other theories of competitive response. In contrast to theories of inertia, we show that in response to acquisitive entry, some firms actually restructure their product mix. In contrast to theories of differentiation, we show that in response to acquisitive entry, some firms do not differentiate from the entrant. Moreover, in contrast to theories of imitation, we show that in response to acquisitive entry, some firms resist the pressure to imitate and actually perform better as a result. Finally, in contrast to simple models that rely purely on rational economic reasoning, we show that social–psychological factors play an important role in how managers respond to competitive entry. While alternative theories can explain a subset of the phenomena we study, we believe that our framework offers a comprehensive explanation of the differences in firm behavior and performance consequences following acquisitive entry. Furthermore, by empirically examining reactions and performance outcomes in a large and vital industry and by using a data set that is fairly unprecedented in its scope and size, we provide significant initial empirical evidence in support of our arguments.

Implications

Aspirations may explain entry response strategies that fall outside the predictions of simple economic models To best understand the differences between our empirical findings and those predicted by, for example, simple Hotelling-type economic models, it is helpful to cast our context in the following terms We have incumbents and entrants, each picking a product mix A product mix in our case consists of a portfolio of loans (i e , type of loan and how much) Firms' decisions can now be thought of in two ways First, one could conceive of two firms deciding on their product positioning, in line with Hotelling There would then be two opposing forces influencing each firm's choice of position (1) a demand effect, which would move them toward each other to the position where maximum demand is, thus leading to minimal differentiation, and (2) a strategic effect, which would move them away from each other (maximal differentiation) to minimize competition With the entrant's position fixed (which is what maps onto our case), the balance of these two forces would suggest where the incumbent would locate Our H_1—the incumbent would mimic the entrant—suggests that the force toward minimal differentiation overrides that toward maximal differentiation Indeed, if competition is in quantities and not in prices, we would expect minimal differentiation In short, one could, albeit with quite a few simplifications, view our story as similar to one variant of a Hotelling model However, if the equilibrium strategy for the incumbent that the Hotelling model suggests is one of minimal differentiation, that should indeed be the one that yields the highest profits However, we find the opposite, suggesting that forces other than those implied by simple Hotelling-type models are at play, our framework is an attempt to precisely accommodate these forces This said, we acknowledge that the reduced-form measures in our empirical model may not fully tap the variety of demand effects and strategic effects at play We hope our study serves as an impetus for more comprehensive analyses of these effects

Other frameworks dealing with entry describe response strategies to entry ("top dog," "puppy dog," "lean and hungry," "fat cat") in a two-period Stackelberg game (Fudenberg and Tirole 1984) These frameworks suggest different strategies for the incumbent according to whether the variables of interest are strategic complements or substitutes If one were to think of competition for a set of loans as quantity competition (strategic substitutes) rather than price competition (strategic complements), the model would suggest a top-dog strategy—that is, the incumbent should invest aggressively While Fudenberg and Tirole's (1984) focus is on the quantum of investment, the result can be interpreted somewhat loosely as suggesting a strategy similar to what we observe—that is, go after the same product space that the entrant is going after However, again, it is difficult to reconcile that reasoning with the notion that this strategy seems to lead to poorer performance outcomes for incumbents that follow such a strategy In contrast, our framework can explain the tendency to either mimic or differentiate from the entrant as well as the performance consequences of the response strategy that incumbents choose to implement We hope that our research provides an impetus for others to study managers' motivations in explaining firms' strategic decisions and performance outcomes

Managerial aspirations may incorrectly encourage imitative behavior Much existing research treats managers as rational calculators governed only by cool-headed considerations of profit and loss In contrast, we argue that managers are also driven by other, more social motivations Our results and the insights from interviews with banking executives suggest (1) that managers compare their firms with other firms in the market and then either aspire to be like those firms or choose to dissociate from them and (2) that this tendency is stronger for large incumbents Although we were not able to directly test the extent to which managers rely on aspirations in their decision making, descriptive statistics from our sample provide some face validity for our assertions For example, we find that the incumbents in the top similarity quartile (the top 25% incumbents that restructured their strategy to be closest to that of the acquirer) are, on average, more than four times larger than the incumbents in the remaining quartiles Thus, we find strong evidence that large incumbents indeed mimic the acquirers, despite negative consequences on their performance We also find that the similarity between these incumbents and the acquirer increases following the acquisition (i e , the differences in similarity from one period to another following the acquisition are statistically significant), which indicates that the effects we identify are not just a reflection of large firms following similar strategies but rather that of actual changes to incumbents' product mix in an attempt to imitate the acquirer

Imitation is hazardous A key implication of our findings for the managers of large incumbent firms is that closely mimicking the product mix strategies of the acquisitive entrant will hurt their performance Conversely, large incumbents can actually prosper following the entry of a behemoth if they employ a product mix strategy that is different from that of the entrant Indeed, an examination of the performance of such incumbents shows that large incumbents (above median assets) in the bottom similarity quartile (the top 25% incumbents that restructured their strategy to be furthest from that of the acquirer) exhibit significantly better performance than any other incumbents Again, this provides some evidence that our results are not simply a reflection of large firms adopting similar strategies, whether they are new entrants or established incumbents

Acquisitive entry in small markets or by well-performing acquirers is a highly salient and potentially disruptive event Managers of large incumbents may find the success of the acquirer appealing, or they may view the acquirer's strategy in a small market as the only legitimate one Whatever drives their aspirations, managers would do well to avoid the hubris of thinking that they can win by offering the same products as the behemoths, such thinking is likely to lead to expensive mistakes

Understanding competitive reaction at the product portfolio level requires a distinct perspective from that used to understand reaction to entry with a new product Most research in marketing that has examined reactions to competitive entry has focused on market entry with new products rather than on acquisitive entry. Accordingly, the determinants of the reaction to entry that have been most closely examined are various components of the product mix (e.g., Carpenter and Nakamoto 1990; Hauser and Shugan 1983) and the innovativeness of the newly introduced product (e.g., Kuester, Homburg, and Robertson 1999). These insights are not particularly helpful for managers faced with the entry of a large acquirer that is not launching a new product. However, such entry is prevalent in industries such as computer software and pharmaceuticals, in which large firms routinely acquire smaller counterparts to become a player in a certain product category. Our research is a first step in providing a set of determinants of the reaction to a distinct and unique type of entry, namely, that of a large acquirer. We hypothesize and empirically show that incumbent, acquirer, and market characteristics contribute in counterintuitive ways to the manner in which the incumbent proceeds to defend its market position.

Limitations and Further Research

As an early study of a largely unexplored domain, our research has limitations that could potentially serve as topics for further research. First, we focus on a single industry—banking. Doing so enhances the internal validity of the study and permits access to unusually rich data that are unavailable in other contexts. Moreover, acquisitive entry is by far the most frequent means of entry by large firms in this market; this feature of the industry fits well with our focus on acquisitive entry. However, our hypotheses and conceptual arguments are not unique to banking. They are general in nature and might also apply to other industries. Nevertheless, the commercial banking industry is characterized by a high degree of regulation and some specific "rules of the market." Further research might examine incumbent reactions to entry by large firms in other industries.

Second, while acquisitions are a common mode of entry in banking and many other industries, other modes of entry, such as greenfield or alliance formation, also exist and are worth exploring, especially in industries in which such modes of entry are common. Therefore, further research might examine how incumbent reactions to acquisitive entry differ from other modes of entry by firms.

Third, we focus on the impact of managerial aspirations on the firm's product mix. Such aspirations might also affect other dimensions of the firm's marketing strategy. The role of a firm's product mix strategies in competitive interaction is of keen interest to researchers in many fields and to practitioners across sectors. Nevertheless, further research on industries with more direct data on other strategic areas that managers are likely to focus on in forming aspirations and reacting would bring additional insights to bear on the effects of market entry on the strategies of incumbents.

Fourth, while we find performance benefits for incumbents that differentiate from entrants following entry, we are unable to examine the counterfactual—that is: What would have happened had incumbents not adjusted their product mix strategy accordingly? Further research might explore the performance consequences of incumbent response more rigorously by controlling for all other differences across markets—for example, by including market fixed effects in the estimation.

Fifth, because we cannot directly observe the thought processes of the managers of incumbent firms, there may be alternative explanations for the imitative behavior we document. For example, imitative behavior might be driven by scarce resources and the perceived threat to these resources. In a market with scarce resources, an alignment in product mix strategy is more likely to be observed among large incumbents that are forced to vigorously compete for these limited resources than among smaller incumbents, which could coexist alongside the entrant. Although we control for market-level variables such as market size and purchasing power, as well as for firm resources, further research might examine the conceptual issues implied in the scare resources and perceived threats argument.

Finally, further insights could be obtained in industries in which targets' strategies can be clearly delineated after the acquisition. While in the banking industry the target's strategy is typically immediately aligned with that of the acquirer, in other industries, the targets may be afforded some flexibility in continuing to serve their markets (partial acquisitions, though extremely uncommon in banking, would provide a context in which targets may retain some control over their product mix strategies). Incumbents would then be faced with a firm acting locally but with the potential to draw from a larger resource base. Furthermore, such a context would allow researchers to assess the effect of the complementarity between the target and the acquirer following the acquisition. It would be helpful to understand how incumbents react and perform in such instances.

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Elisabeth C. Brüggen, Bram Foubert, & Dwayne D. Gremler

Extreme Makeover: Short- and Long-Term Effects of a Remodeled Servicescape

Using survey and transaction data from a natural experiment in a fast-food chain, the authors investigate the effects of store remodeling. They test (1) short- and long-term effects on customers' cognitions, affect, and behavioral intentions, (2) the moderating impact of spontaneous versus planned and group versus single-customer store visits, and (3) the differential effects on two store performance measures: average customer spending and store traffic. The results show that, in line with adaptation-level theory, short-term remodeling effects lose strength in the long run (i.e., after six months). Furthermore, customers on a spontaneous trip or in a group tend to be more responsive to store remodeling than customers on a planned trip or alone. Finally, whereas average spending increases in the short run and then returns to the baseline, store traffic initially remains unaffected and even shows a dip in the long run. These findings imply that ignoring the time-variant character of remodeling effects, the nature of customers' store visits, or the impact on store traffic may lead to inappropriate allocation of marketing resources.

Keywords: servicescape, store remodeling, adaptation-level theory, marketing effectiveness, long-term effects

Retailers spend millions of dollars each year to design, build, and furnish their establishments. Cutthroat competition prompts them to employ the store environment as a source of differential advantage. For example, in 2002, the restaurant chain Red Lobster started changing its traditional "wharf-side" layout to a "coastal home" setting (*Nation's Restaurant News* 2003). McDonald's recently began redesigning its 30,000 eateries, in a makeover of unprecedented scale, to provide the stores with a contemporary, welcoming image (Gogoi, Arndt, and Moiduddin 2006). In addition, in 2007, Victoria's Secret announced that it would remodel 80% of its stores over a five-year period (Merrick 2008).

Despite the pervasiveness of store remodeling, research to date does not provide a sufficient understanding of customer responses to store makeovers. Various empirical studies document the relationship between the physical store environment, or "servicescape" (Bitner 1992), and customers' cognitive, affective, and behavioral reactions. Research has demonstrated that customer response is influenced by individual servicescape parameters, such as color or lighting (e.g., Areni and Kim 1994; Crowley 1993), as well as more abstract store characteristics, including store design and ambience (e.g., Baker et al. 2002). However, several key issues that affect the assessment of store remodeling effects remain unaddressed. First, extant research is mainly cross-sectional and examines differences between alternative servicescapes in a static setting, such that it remains unclear whether the effects of a store remodeling vary over time. Second, few studies examine how store-visit characteristics moderate servicescape effects. As a result, current research falls short in identifying settings in which remodeling pays off more. For example, the (un)planned character of a visit or the presence of companions may influence how customers attend to a remodeled servicescape. Third, current literature focuses exclusively on in-store responses to the servicescape. However, a complete evaluation of the remodeling impact on store performance also requires an understanding of whether remodeling brings more people into the store in the first place.

In this study, we assess the effects of store remodeling on customers' cognitions, affect, and behavioral intentions, as well as on store performance. The purpose of our research is threefold. We (1) contrast the short-term effects with those found in the long run, (2) address the moderating role of store visit characteristics by studying spontaneous versus planned and group versus single-customer visits, and (3) compare the remodeling effects on two objective store performance measures, one that represents consumers' in-store behavior (average customer spending) and one that captures consumers' decisions to visit the store (store traf-

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fic). To this end, we use both survey and transaction data from a natural experiment in a fast-food chain that undertook a major remodeling project. The survey data measure cognitions, affect, and behavioral intentions of customers in both a remodeled and a control store, collected at four points in time up to one year after the remodeling. The transaction data include weekly spending and store traffic data for the same two stores and cover the same postremodeling period. We employ a multiple-indicator, multiple-cause (MIMIC) approach to analyze the survey data and regression analysis to model the store performance metrics.

We organize the rest of this article as follows. First, we outline our contributions to extant literature and derive hypotheses. We then describe our field experiment and data collection, discuss our analysis techniques, and present the results. Finally, we draw conclusions and note some limitations and opportunities for further research.

Study Contributions

We define "store remodeling" as the creation of a new servicescape that incorporates a substantially different store design. Thus, in contrast with "store renovation," which involves relatively minor changes in the servicescape (e.g., wall repainting), store remodeling typically entails significant changes in several servicescape dimensions, including ambience, layout, and signage and décor (Bitner 1992). Because companies usually carefully select the new characteristics of the store environment through such means as market research or concept tests, our research explicitly focuses on remodeling projects that customers perceive as a change for the better. The question then becomes whether such (positively perceived) store makeovers also lead to improvements in managerially relevant measures such as perceived service quality or customer spending.

Although no prior studies have explicitly addressed the effects of store remodeling, two streams of servicescape research examine the relationship between the store environment and customer responses. One stream demonstrates that consumers respond to changes in individual servicescape parameters, including music (e.g., Areni and Kim 1993; Milliman 1982), colors (e.g., Crowley 1993), lighting (e.g., Areni and Kim 1994), and scent (e.g., Mattila and Wirtz 2001). The other stream investigates consumer responses to more abstract store dimensions, such as design (e.g., Baker et al. 2002), ambience (e.g., Baker, Grewal, and Parasuraman 1994; Sharma and Stafford 2000), or overall servicescape perceptions (e.g., Hightower, Brady, and Baker 2002). Bitner (1992) incorporates many of these relationships in her theoretical framework, arguing that the servicescape serves as a surrogate indicator of intangible service performance and helps consumers form cognitive and affective responses and behavioral intentions toward the store's offering (see also Baker, Grewal, and Parasuraman 1994).

The context of store remodeling enables us to contribute to servicescape literature in three ways. First, most extant studies are cross-sectional and examine differences between store environments in a static, timeless setting (e.g., Baker, Grewal, and Parasuraman 1994), without proposing or testing any differences between short- and long-term effects. This approach implicitly suggests that short- and long-term effects are the same. However, research in environmental psychology indicates that reactions to a new environment are dynamic (e.g., Russell and Lanius 1984). Ignoring the time-variant character of servicescape effects may lead to inappropriate conclusions. For example, if customers' responses to a new store environment wear off over time, assessing only the short-term effects may lead to an overstatement of the overall impact and a suboptimal allocation of marketing resources. Therefore, we study both short- and long-term remodeling effects on cognitive, affective, and behavioral intention measures.

Second, precious little research has identified the conditions that enhance or weaken the role of the servicescape. An exception is Kaltcheva and Weitz's (2006) study, which shows that an exciting servicescape increases shopping intentions for recreational but not for task-oriented store trips, suggesting that store visit characteristics may moderate the effectiveness of store remodeling. In this study, we examine remodeling effects for spontaneous versus planned and group versus single-customer store visits—characteristics that the literature has identified as potential drivers of shopping behavior (e.g., Inman, Winer, and Ferraro 2009; Kahn and Schmittlein 1992). For example, previous research has suggested that consumers in an "unplanned state" are more inclined to include price and promotion information in their purchase decision (Bucklin and Lattin 1991). Other work shows that the influence of companions can increase the urge to purchase (Mangleburg, Doney, and Bristol 2004). Both moderators involve managerially relevant characteristics that are relatively easy to observe or measure and have discriminant power in that they can reveal the situations, customers, store locations, or industries for which servicescape management is especially important. For example, remodeling the servicescape may work differently for sectors in which store visits are spontaneous (e.g., a card and gift store) rather than planned (e.g., a supermarket). In addition, a sandwich shop in a city's financial district with a high proportion of single visitors may be affected differently by remodeling than one in a shopping area attracting groups of consumers.

Third, despite recent calls to improve marketing accountability (e.g., Lehmann 2004), most servicescape research investigates effects on self-reported measures of psychological constructs (cognitions, affect, or behavioral intentions) and ignores objective store performance. Servicescape studies that feature objective measures focus solely on customers' in-store behavior, such as money spent (e.g., Areni and Kim 1993, 1994; Milliman 1982) or the number of items purchased (Areni and Kim 1993, 1994; Spangenberg et al. 2006), but they reveal little about the effects on customers' decision to visit the store in the first place. Yet store performance hinges on store-visit decisions as well as in-store purchase decisions, and both decision types have been identified as critical "approach behaviors" toward the servicescape (see Bitner 1992; Mehrabian and Russell 1974). Moreover, research indicates that marketing instruments tend to affect these behaviors differently, such that ignoring one of them may lead to inaccurate managerial conclusions (e g , Van Heerde, Gijsbrechts, and Pauwels 2008) In our study context, the essential difference between these behaviors is that in-store purchase decisions occur upon the consumer's actual exposure to the store environment, whereas the decision to visit the store naturally takes place before arriving in the servicescape Therefore, in addition to analyzing cognitive, affective, and behavioral intention measures, we compare the effects of remodeling on two important store performance metrics average spending per customer, which captures in-store purchase behavior, and store traffic, which corresponds to consumers' decisions to visit the store Research in other marketing domains has used the same metrics to assess objective store performance (e g , Van Heerde and Bijmolt 2005)

Hypotheses Development

Short- and Long-Term Effects on Cognitions, Affect, and Behavioral Intentions

Short-term effects Ample conceptual and empirical work suggests that the servicescape can serve as "physical evidence" and provide informational cues that help customers develop their beliefs, feelings, and behavioral intentions toward the store's offering (e g , Baker et al 2002) An appealing store environment (either in general or on certain dimensions) positively influences cognitive and affective responses, such as attitudes, satisfaction, perceived quality and value, and store image (Baker, Grewal, and Parasuraman 1994) The servicescape also has a positive impact on behavioral constructs, such as word-of-mouth communication and loyalty (Hightower, Brady, and Baker 2002)

Although these studies are static, their findings seem especially relevant shortly after a store remodeling, when many customers are confronted with the new servicescape for the first time (Baker et al 2002) The informational value of the servicescape is indeed highest when people are unfamiliar with the store environment (e g , Baker, Grewal, and Parasuraman 1994, Baker et al 2002) Novel stimuli are more salient (e g , Berlyne 1970) and thus tend to attract people's attention and influence their thoughts and feelings According to Bitner's (1992) framework, positive cognitive and affective responses to the servicescape in turn generate positive effects on consumers' behavioral intentions Therefore, we expect that cognitions, affect, and behavioral intentions improve in the short term after a remodeling

> H_1 Store remodeling has a positive short-term effect on (a) cognitions, (b) affect, and (c) behavioral intentions

Long-term effects Environmental psychologists warn that ignoring the dynamic aspects of people's responses to environmental stimuli will result in an incomplete account of environmental effects (e g , Russell and Lanius 1984) These researchers refer to adaptation-level theory (Helson 1964), which posits that a person perceives stimuli only relative to an adapted standard Changes in stimuli may produce effects, but then the new experiences become integrated into the adaptation level and thus become the new frame of reference Mehrabian (1995) uses the term "habituation" to refer to the phenomenon by which the influence of an environment decreases with repeated exposure As a result, short-term reactions to environmental stimuli lose strength in the long run (Russell and Lanius 1984) For example, job satisfaction and behavioral outcomes peak shortly after a job change but then return to an equilibrium (termed the "honeymoon-hangover effect", e g , Boswell, Boudreau, and Tichy 2005) Gerontologists describe the impact of an environmental change on older people and point out that awareness of the new environment decreases as familiarity with the new setting increases (e g , Lawton 1990)

In line with adaptation-level theory, we expect that customers' short-term reactions to the remodeled servicescape wane in the long run, as they become more familiar with the new store environment That is, as time goes by, an increasing number of customers are (repeatedly) exposed to the new design and integrate impressions of the new environment with their adaptation levels As a result, we expect any initial remodeling effects to taper off

> H_2 Any short-term impact of store remodeling on (a) cognitions, (b) affect, and (c) behavioral intentions loses strength in the long run

Moderating Effects of Spontaneous Versus Planned and Group Versus Single-Customer Visits

In H_1 and H_2, we describe the general effects of store remodeling across time but ignore the nature of the store visit Therefore, we also consider how two specific store visit characteristics may lead to upward or downward shifts in customer responses

Spontaneous versus planned visits Research has shown that consumers may rely on shopping scripts that consist of predetermined sequences of actions to facilitate the shopping process (e g , Bower, Black, and Turner 1979) We argue that consumers who plan their store visits are more likely to rehearse and define their shopping behavior, thereby generating or activating shopping scripts (Block and Morwitz 1999) In contrast, consumers who do not plan their shopping trips are more likely to rely on external information and let the store environment shape their purchase trip For example, consumers who do not contemplate their purchases before entering the store are more responsive to in-store promotions (Bucklin and Lattin 1991) Similarly, customers on a spontaneous shopping trip should be more influenced by a remodeled servicescape than customers who plan their trips in advance The argumentation holds in both the short and long run

> H_3 The effects of store remodeling on (a) cognitions, (b) affect, and (c) behavioral intentions are greater for spontaneous than for planned trips

Group versus single-customer visits In general, research supports the notion that the presence of companions during the shopping or consumption process reinforces consumers' responses (Tombs and McColl-Kennedy 2003) Consumption in a group often involves an experiential process in which consumers interact and exchange opinions These interactions can increase appraisals of and emotional responses to the consumption experience (Holt 1995), of which the servicescape forms an essential part The presence of companions also may prompt consumers to exhibit more pronounced behavioral responses, such as in their consumption amount (e g , Clendenen, Herman, and Polivy 1994) or time spent in the store (Sommer and Sommer 1989) Researchers attribute these enhanced behavioral reactions to increased levels of arousal or conformity to social norms (Tombs and McColl-Kennedy 2003) Similarly, the presence of companions may strengthen consumers' behavioral response to a remodeled servicescape In summary, we expect customers in a group to react more favorably to a remodeling than single customers, in both the short and long run

> H_4 The effects of store remodeling on (a) cognitions, (b) affect, and (c) behavioral intentions are greater for group than for single-customer visits

Effects on Store Performance: Average Customer Spending Versus Store Traffic

Average customer spending and store traffic correspond to two specific approach behaviors purchasing and visiting the store (Bitner 1992) As such, they should exhibit response patterns similar to those we have described previously (see H_1 and H_2) Nonetheless, these performance metrics deserve separate attention because customer spending is likely to be more sensitive to remodeling than is store traffic Spending takes place when customers are physically present in the store environment and is therefore prone to the influence of the remodeled servicescape, at least in the short run Previous research has demonstrated that even minor changes in store atmosphere can increase the amount spent (e g , Spangenberg et al 2006) Store traffic also might benefit from the remodeling (e g , through curiosity visits), but for at least two reasons, we expect any such positive effect to be modest compared with the impact on spending

First, the decision to visit a store naturally occurs outside the servicescape and is therefore less susceptible to the influence of the store environment (Bettman 1979) To include the servicescape in their store visit decisions, consumers must draw on their mental representations of the store environment (cf Tversky 1981), which arguably are less powerful than a direct exposure A few studies have shown that elements of a store's environment can influence store choice (see Pan and Zinkhan 2006) However, most of the literature on store choice either ignores the role of the servicescape or finds it overshadowed by the impact of factors such as assortment or situational variables (e g , Bell, Ho, and Tang 1998, Van Kenhove, De Wulf, and Van Waterschoot 1999)

Second, for some consumers, remodeling may actually lead to negative store traffic effects In particular, a store remodeling may disrupt consumers' habitual behaviors and lead them to identify and pursue other alternatives (Moe and Yang 2009) [1] As a result, during the rebuilding, some consumers may switch to other stores, a behavior that could persist after the remodeling has been completed, in the short and even the long run

Thus, although traffic might respond positively to store remodeling, we expect any such effects to be lower than the spending effects Because we measure the effects on spending and traffic as percentage changes, we can explicitly compare them

> H_5 The percentage impact of store remodeling on store traffic is less than its percentage impact on average customer spending

Data and Research Design

We employ a natural experiment in European branches of a U S -based fast-food chain In 2006, the chain started a major store remodeling effort involving substantial changes to the lighting, spatial layout, furnishings, paintings, color schemes, and several other factors (see Appendix A) We combine multiperiod survey data with weekly store performance data to test our hypotheses The data come from a treatment store that was remodeled and a control store whose servicescape remained unaltered We use a pretest/posttest control group design, as Shadish, Cook, and Campbell (2002) suggest, to control for preremodeling differences in the dependent measures between the treatment and control stores and accommodate changes across time not due to the remodeling

In view of our hypotheses tests and context, we define short-term effects as those that take place within the first half-year after the store remodeling and long-term effects as those that set in thereafter Sloot, Fok, and Verhoef (2006) use the same definition for their research on assortment reductions in the detergent category, which features similar purchase cycles [2]

Store Selection

To avoid confounding effects, we match the treatment and control stores carefully on several criteria First, both stores are situated along major traffic arteries in commercial strips with big-box retailers Second, households within a ten-minute driving distance are similarly distributed across Experian's global lifestyle and sociodemographic segments, and the cities in which the restaurants are located have similar population sizes and unemployment rates Third, competition from other fast-food chains in the vicinity is similar for both restaurants Within a 15-mile radius, there is no competition from other major fast-food chains Fourth, both stores use the same price setting and have the same product offering Fifth, the two stores are managed in a similar way They both (1) operate under the same (strict) standard operating procedures, (2) receive similar scores from mystery shopper visits and company inspectors, and (3) have comparable management turnovers Sixth, to account for other characteristics that we could not observe directly, we chose stores with comparable sales fluctuations during the preremodeling period Even after deseasonalization, the correlation coefficient of the stores' weekly sales still amounted to 82

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[1] We thank an anonymous reviewer for pointing out this possibility

[2] The average resident in the studied market visits this fast-food chain almost 11 times per year ACNielsen data indicate that the detergent category has similar purchase frequencies (approximately nine times per year) The definition of short-term and long-term may differ in other settings

Remodeling took about three weeks (during which the store remained open) and did not entail confounding changes in other marketing mix elements or affect seating capacity Post hoc checks also indicate that after the remodeling, the socioeconomic and business environments of both stores remained similar For example, in both cities competition remained stable, and unemployment followed the same slightly decreasing pattern during our observation period

Survey Data

We use survey data to test the cross-time effects on cognitions, affect, and behavioral intentions (H_1 and H_2), as well as the moderating impacts of spontaneous versus planned and group versus single-customer visits (H_3 and H_4) Specifically, we conducted surveys with 2997 customer respondents at four points in time 2 months before the remodeling (Wave 1 599 respondents in the treatment store and 93 in the control store), right after the remodeling (Wave 2 782 and 100 respondents, respectively), 5 months after the remodeling (Wave 3 677 and 103 respondents, respectively), and 12 months after the remodeling (Wave 4 421 and 222 respondents, respectively)[3] In line with our definition of short term and long term, Waves 2 and 3 represent the short-term effects, and Wave 4 captures the long-term effects Each data collection period lasted a week to ensure that we covered different days of the week and different times of the day Within a given time window, respondents were selected through convenience sampling All interviewers received the same instructions regarding when to hand out questionnaires, how to address potential questions, and when to collect completed questionnaires Customers filled out the questionnaires after they had eaten in the restaurant and experienced the environment Every respondent received a voucher for a free menu item as a token of appreciation Nonresponse rates were similar in both stores, with an average of 24 3% in the treatment store and 26 5% in the control store

We selected the measures included in our questionnaire on the basis of a review of current servicescape research Though nonexhaustive, our nine constructs cover cognitive, affective, and behavioral aspects that have direct managerial relevance To measure these constructs, we adapted existing multiple-item scales (see Appendix B) We included (1) three cognitive constructs perceived value (Cronin et al 1997), perceived service quality (Hightower, Brady, and Baker 2002), and store image (Graeff 1996), (2) three affective constructs overall satisfaction (Bitner and Hubbert 1994), encounter satisfaction (Bitner and Hubbert 1994), and attitude (Day and Stafford 1997, Muehling, Laczniak, and Stoltman 1991), and (3) three behavioral intentions loyalty (McMullan 2005, Zeithaml, Berry, and Parasuraman 1996), desire to stay (Hightower, Brady, and Baker 2002, Wakefield and Blodgett 1996), and word-of-mouth communication (McGregor 2006, Reichheld 2003, Zeithaml, Berry, and Parasuraman 1996) We do not include purchase or store-visit intentions because these responses are captured by our store performance data (see the following subsection) With the exception of the store image and attitude items, for which we use five-point semantic differential scales, items are measured on five-point Likert scales Two bilingual natives translated the original instruments into the local language and back into English independently We adjusted the translated items to resolve the few conflicts between the original and back-translated versions

To investigate the moderating role of the type of store visit, we included two questions to determine whether the respondent's store visit was planned or spontaneous and whether he or she came alone or with a group Following other servicescape research (e g , Areni and Kim 1993), we also added categorical control variables for gender and age (younger than 29, 30–39, 40–49, 50–59, and older than 60 years)

We evaluate the psychometric quality of our scales with a confirmatory factor analysis (CFA) of the pooled survey data, using maximum likelihood estimation (see Appendix B) We drop one item of the original store image scale and allow for nonzero error correlations within the loyalty and word-of-mouth scales, because the chain-related items from those scales have common variance that they do not share with the store-related items (or vice versa), we freely estimate the error correlations of the two chain-related loyalty items, the two chain-related word-of-mouth items, and the two store-related word-of-mouth items The chi-square statistic for the final CFA model is significant, but the comparative fit index (CFI), Tucker–Lewis index (TLI), normed fit index (NFI), and root mean square error of approximation (RMSEA) all suggest good model fit ($\chi^2(213) = 1747\ 54, p <$ 01, CFI = 98, TLI = 97, NFI = 97, and RMSEA = 055, e g , Browne and Cudeck 1993) Furthermore, the coefficient alpha values and Spearman-Brown corrected correlations reveal acceptable scale reliabilities Finally, we establish discriminant validity on the basis of a significant decrease in model fit when we set any of the construct correlations to 1 (Anderson and Gerbing 1988)

Store Performance Data

We supplement our survey data with customer spending and store traffic information for both the treatment and control stores Specifically, we study the weekly average transaction amount and the weekly number of transactions This information enables us to shed further light on the remodeling effects over time (H_1 and H_2) and compare the effects on customers' decision to spend and their decision to visit the store (H_5) The data cover a time period from approximately 8 months before to 13 months after the remodeling, or 92 weeks in total Although a single transaction may involve meals sold to different consumers (e g , families), we consider the number of transactions an indicator of store traffic and the average transaction amount a measure of average customer spending.

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[3] The samples are smaller in the control store, at the company's request Hancock, Lawrence, and Nevitt (2000) show that unbalanced samples do not increase the Type I error rate if the samples have the same measurement model A comparison of constrained and unconstrained multigroup confirmatory factor analyses indicates that this is the case for our data Details are available on request

Manipulation Check of Servicescape Perceptions

A premise of our research is that the remodeling involves a change for the better. In other words, a servicescape can be modified in many ways, but we assume the remodeling company carefully selected servicescape characteristics that optimize the appeal of the store environment. To test whether servicescape perceptions truly increase after the remodeling, our survey also featured a 13-item battery to measure respondents' perceptions of the store environment (see Appendix C). These items match previous servicescape literature (Bitner 1992; Hightower, Brady, and Baker 2002) and pertain to Bitner's (1992) ambient, layout/functionality, and signs/symbols/artifacts dimensions, as well as Baker, Grewal, and Parasuraman's (1994) ambient and design dimensions.

For this manipulation check, we employ a two-way multivariate analysis of covariance (MANCOVA), in which store (treatment/control) and wave (1/2/3/4) serve as the factors and gender, age, and the two store visit characteristics (spontaneous/planned and group/single customer) represent the covariates.[4] The overall interaction effect between store and wave is highly significant (Wilks' $\Lambda = .895$, $F(39, 8031.6) = 7.830$, $p < .001$, partial $\eta^2 = .04$), which implies that respondents' perceptions of the treatment store follow a significantly different pattern over time compared with the control store perceptions. The individual interaction coefficients (Appendix C) indicate that, with the exception of in-store lighting, all items show significant ($p < .05$) improvements in the remodeled store, in both the short (Waves 2 or 3) and long (Wave 4) run.[5] Thus, the remodeling undertaken improves customer perceptions of the servicescape overall.

Analyses

Analysis Survey Data

We use a MIMIC approach to analyze the survey data. Such models are common in situations in which a set of background variables (causes) affect one or more latent constructs, as measured by a set of outcome variables (indicators) (Jöreskog and Goldberger 1975). In our MIMIC model, the indicators are items that measure the cognitive and affective responses and behavioral intentions. The causes are the same for all nine dependent constructs and involve (interactions among) the following variables:

STORE1 = 1 for observations made in the treatment store and 0 otherwise;
WAVE2, WAVE3, and WAVE4 = 1 for observations made during the second, third, and fourth wave, respectively, and 0 otherwise;
SPONT = 1 for spontaneous visits and 0 otherwise;
GROUP = 1 for group visits and 0 otherwise;
GENDER = 1 for female and 0 for male respondents; and
AGE2, AGE3, AGE4, and AGE5 = 1 if the respondent belongs to the second (30–39 years), third (40–49 years), fourth (50–59 years), or fifth (60 years and older) age bracket and 0 if otherwise.

In addition to the main effects of these variables, we include specific interaction effects to model the phenomenon of interest. First, the interactions STORE1 × WAVEw measure the remodeling effects in wave w (w = 2, 3, 4) relative to the first (i.e., preremodeling) wave. These interactions capture the extent to which the differences between the response measures of the treatment and control stores before the remodeling change in the postremodeling waves. Second, the interactions STORE1 × WAVEw × SPONT and STORE1 × WAVEw × GROUP represent the incremental remodeling effects in wave w (w = 2, 3, 4) when we consider a spontaneous versus planned visit or group versus single-customer visit, respectively. In these interactions, we mean-center SPONT and GROUP to ensure the coefficients of the STORE × WAVE interaction terms can be interpreted as average effects across consumers.[6]

Analysis of Store Performance Data

We model average customer spending and store traffic as exponential functions of their explanatory variables:

$$AS_{it} = \exp[\alpha_i + X_{it} \times \delta + f(t) + I_{it} \times k(t) + \varepsilon_{it}], \text{ and} \quad (1)$$

$$ST_{it} = \exp[\beta_i + X_{it} \times \phi + g(t) + I_{it} \times m(t) + \upsilon_{it}], \quad (2)$$

where

AS_{it} = average customer spending (in euros) in restaurant i in week t (i = 1, 2; t = 1, 2, . . . , 92),
ST_{it} = store traffic (i.e., number of transactions) in restaurant i in week t,

---

[4] Note that our perceived servicescape scale is formative. Without reflective measures, the perceived servicescape construct would remain unidentified in a structural equation modeling analysis. Therefore, we employ MANCOVA, using the individual items as separate dependent variables while allowing for correlated errors (Thompson and Green 2006). An analysis of covariance of the summed item scores leads to the same conclusion—namely, that perceptions increase significantly ($p < .05$) after the remodeling.

[5] In the new store design, the light intensity automatically adjusts to account for outside weather conditions, which may have led to inconsistent perceptions and, thus, insignificant differences between the two store designs. Therefore, we ran an online survey and randomly assigned 104 respondents to view pictures of either the new or the old store design under normal weather conditions. These respondents completed a multi-item perception scale similar to that in our main study. All perceptions, including those regarding lighting, were significantly higher ($p < .05$) for the new than the old store design. Details are available on request.

[6] Our MIMIC analysis bears some resemblance to multivariate analysis of variance (MANOVA), which can also assess shifts in multivariate measures. However, in comparison with MANOVA, a MIMIC model accounts for the measurement error of the response items and leads to lower Type II errors (cf. Hancock, Lawrence, and Nevitt 2000).

X_{it} = a row vector of control dummy variables indicating promotions, public holidays, school vacations, and the construction period for remodeling the store (during which it remained open),

I_{it} = an indicator equal to 1 if restaurant i is the remodeled restaurant and week t is a postremodeling week, and 0 otherwise,

f(t) and g(t) = functions capturing baseline fluctuations in AS_{it} and ST_{it}, respectively. The parameters of these functions must be estimated,

k(t) and m(t) = functions capturing the incremental changes in AS_{it} and ST_{it}, respectively, due to the remodeling. The parameters of these functions must be estimated,

α_i and β_i = store-specific intercepts to be estimated,

δ and ϕ = vectors of response coefficients to be estimated, and

ε_{it} and υ_{it} = normally distributed error terms.

In an exponential model, the estimated parameters have relative meaning, that is, they should be interpreted as percentage changes relative to the restaurant's baseline (Sloot, Fok, and Verhoef 2006). Thus, the functions f(t) and g(t) capture percentage changes over time in AS_{it} and ST_{it}, respectively, and are common to both the treatment and the control restaurant; k(t) and m(t) instead are unique to the treatment store and refer to the incremental percentage changes in the weeks after the remodeling. The challenge when modeling the time functions f, g, k, and m consists of selecting a sufficiently flexible form without overweighting the deviant observations. To this end, we opted for polynomial functions whose degree depends on model fit.[7] In our estimations, sixth-degree polynomials lead to the highest adjusted R-square, so we express the impact of the store redesign r weeks after the remodeling as follows:

$$(3)\ a_0 + a_1 \times r + a_2 \times r^2 + \ldots + a_6 \times r^6,$$

where a_0, a_1, a_2, ..., a_6 are the estimated parameters that determine the shape of the polynomial.

Because we can linearize Equations 1 and 2 by taking the natural logarithm and because the functions f, g, k, and m are linear in the parameters, we can estimate our model with generalized least squares. In particular, we employ Parks's (1967) method, which corrects for autocorrelation, heteroskedasticity, and contemporaneous correlation among the four data series (i.e., average spending and store traffic for two stores).

Results

Short- and Long-Term Effects on Cognitions, Affect, and Behavioral Intentions

We estimate our MIMIC model with maximum likelihood. Although the chi-square statistic is significant ($\chi^2(516)$ = 3405.58, $p < .01$), the CFI (.97), TLI (.94), NFI (.96), and RMSEA (.049) indicate good conformance of the data with the model (Browne and Cudeck 1993).[8] To save space, we report only the estimated coefficients of the interaction terms, which capture the mechanisms of interest; the results for the main effects and measurement model are available on request. In Table 1, we present the coefficients of the STORE1 × WAVE2, STORE1 × WAVE3, and STORE1 × WAVE4 interaction terms. These coefficients capture the over-time remodeling effects for the average consumer, because the store visit characteristics are mean-centered.

Short-term effects. All three behavioral intention measures (loyalty, desire to stay, and word-of-mouth communication) and two cognitive measures (perceived value and store image) have significantly positive effects in the second and/or third wave ($p < .05$). These results support H_{1a} and H_{1c} and reinforce Baker et al.'s (2002) and Bitner's (1992) claims that consumers use the remodeled servicescape as a cue to form beliefs about the store and the product offering and adjust their behavior accordingly. However, we find only partial support for H_{1a} because the cognitive measure of perceived service quality remains unaffected. Furthermore, H_{1b} is not supported because the interaction coefficients for the three affective measures (overall satisfaction, encounter satisfaction, and attitude) are nonsignificant. In summary, on average, customers' reactions to the remodeled store environment are cognitive and behavioral rather than affective. We elaborate on these findings in the "Discussion" section.

Long-term effects. As we show in Table 1, we find support for H_{2a} and H_{2c} in that the cognitive and behavioral response measures that increase in the short run lose strength in the long run (fourth wave). The affective measures (see H_{2b}), which do not react in the short run, do not show significant effects in the long run either.

While most measures have no long-term remodeling effect ($p > .10$), store image and desire to stay do not completely return to their baseline levels by the end of the observation period ($p < .01$). Nonetheless, our results lend credence to the application of adaptation-level theory to servicescape changes. That is, customers' initial responses taper off as the remodeled store becomes the new frame of reference.

Although our main interest is in the total short- and long-term remodeling effects on our response measures, we also ran a model in which, in line with Bitner's (1992) conceptual framework, the cognitive and affective reactions are antecedents of intentions. The short- and long-term remod-

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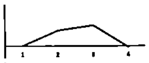
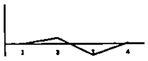
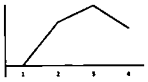
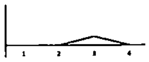
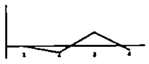
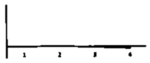
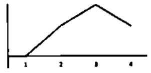
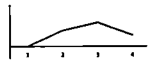
[7] We also estimate more flexible time functions, namely, cubic spline functions (Sloot, Fok, and Verhoef 2006), but these models merely confirm the patterns we find with our more parsimonious polynomial functions.

[8] To validate the assumption of measurement invariance across the eight subgroups in our sample—an assumption that is intrinsic to a MIMIC analysis—we run a series of multigroup CFAs with increasingly restrictive between-group equality constraints. The results indicate that the assumption of measurement invariance is not problematic in our data set (Thompson and Green 2006). Furthermore, we test for differential item functioning (DIF) by running a model that accommodates direct relationships between all items and the "grouping" dummy variables. We set these paths to zero and inspect the modification indexes and expected parameter changes. The data do not exhibit systematic DIF.

TABLE 1
Effects of Remodeling on Affective, Cognitive, and Behavioral Intention Measures

	Estimated Interaction Coefficients (STORE × WAVE)[a]			
	Short Term		Long Term	
Response Measure	**2nd Wave**	**3rd Wave**	**4th Wave**	**Graph**
Cognitive Responses				
Perceived value	210	280*	−014	
Perceived service quality	082	−151	−011	
Store image	588***	815***	506**	
Affective Responses				
Overall satisfaction	−004	118	001	
Encounter satisfaction	−089	181	−056	
Attitude	009	−011	−027	
Behavioral Intentions				
Loyalty	315*	381*	063	
Desire to stay	409***	695***	409**	
Word of mouth	213	321***	151	

*$p < 05$ (one-sided, we conduct one-sided tests for directional hypotheses)
**$p < 01$ (two-sided)
***$p < 01$ (one-sided)
[a]These coefficients capture the extent to which the difference in cognition, affect, or behavioral intentions between the treatment and the control stores increases (+) or decreases (−) compared with the period before the remodeling For example, a coefficient of 210 in Wave 2 indicates that the difference in response between the treatment and control store increases by 210 compared with Wave 1
Notes Model fit $\chi^2(516) = 3405\ 58$, $p < 01$, CFI = 97, TLI = 94, NFI = 96, and RMSEA = 049

eling effects are identical to those obtained with our MIMIC model, but the Sobel test indicates that the effects on desire to stay and word-of-mouth communication are partially mediated by store image ($p < 01$) This additional test provides some support for the notion that consumers use the environment to form beliefs about the store, which in turn affect their behavioral intentions

Moderating Effects of Spontaneous Versus Planned and Group Versus Single-Customer Visits

We report the coefficients of the three-way interaction terms, STORE1 × WAVEw × SPONT and STORE1 × WAVEw × GROUP (w = 2, 3, 4), in Table 2 These coefficients capture the differences in remodeling effectiveness between spontaneous and planned trips and between group and single-customer visits, respectively

Spontaneous versus planned visits In line with H_{3a-c}, consumers on a spontaneous visit tend to respond more positively to the store remodeling than consumers who planned their visit in advance The relevant interaction coefficients (first three columns in Table 2) are consistently positive, and we find significant effects at the cognitive, affective, and behavioral levels Relative to planned visits, spontaneous visits lead to significantly greater effects in the short run (Waves 2 or 3) on the cognitive measure of perceived value ($p < 05$) and two behavioral intention measures, desire to stay ($p < 05$) and word-of-mouth communication ($p < 01$) These differential effects persist in the long run ($p < 01$) Spontaneous visits also trigger significantly greater affective responses in terms of overall satisfaction and attitude, but only in the short run ($p < 05$) In summary, our results support the idea that spontaneous customers rely less on scripts and instead use environmental cues Our finding of mainly short-term effects is in line with Iyer (1989), who argues that consumers rely even more on external cues when they have limited knowledge of the store environment In our case, this is especially true right after the remodeling

Group versus single-customer visits The results provide some evidence that, consistent with H_{4a-c}, customers in a group respond more positively to the remodeling than single customers The significant interaction coefficients (last three columns of Table 2) indicate that group visits tend to induce greater short-term effects on overall satisfaction and desire to stay and greater long-term effects on perceived service quality, overall satisfaction, attitude, and word-of-mouth communication ($p < 05$) The prevalence of long-term effects indicates that the impact of remodeling tends to be more persistent in time for customers in groups However, we find an unexpectedly significant, negative effect ($p < 05$) on perceived value shortly after the remod-

TABLE 2
Moderating Effects of Spontaneous Versus Planned and Group Versus Single-Customer Visits

	Estimated Three-Way Interaction Coefficients (STORE × WAVE × STORE VISIT CHARACTERISTIC)[a]					
	Spontaneous (Versus Planned)			Group (Versus Single Customer)		
Response Measure	2nd Wave	3rd Wave	4th Wave	2nd Wave	3rd Wave	4th Wave
Cognitive Responses						
Perceived value	178	292*	441**	– 442*	111	542
Perceived service quality	032	191	213	041	185	568*
Store image	070	042	061	042	072	072
Affective Responses						
Overall satisfaction	204*	211*	152	240	324*	465*
Encounter satisfaction	015	204	170	172	– 093	660
Attitude	227*	276*	038	065	121	603*
Behavioral Intentions						
Loyalty	177	098	230	– 196	112	675
Desire to stay	364*	524***	627***	– 017	390*	548
Word of mouth	457**	555***	476**	– 187	240	697*

*$p <$ 05 (all tests are one-sided because they pertain to directional hypotheses)
**$p <$ 01
***$p <$ 001
[a] These coefficients capture the extent to which the remodeling effects increase (+) or decrease (–) in the switch from a planned to a spontaneous trip and from a single-customer to a group visit For example, the coefficient of 524 in the second column for desire to stay indicates that, in Wave 3, the desire to stay score was 524 higher for spontaneous trips than for planned trips
Notes Model fit $\chi^2(516) = 3405$ 58, $p <$ 01, CFI = 97, TLI = 94, NFI = 96, and RMSEA = 049

eling Compared with single customers, visitors in groups appear to rely less on the servicescape for their assessments of the value of the store's offering, possibly because they would rather consult their companions (Mangleburg, Doney, and Bristol 2004)

Effects on Store Performance

In Table 3, we summarize the estimation results for Equations 1 (average customer spending) and 2 (store traffic) In the interest of space, we exclude the results for the store intercepts and the baseline functions f(t) and g(t) Although Table 3 includes the effects of promotions, holidays, vacations, and the construction period (which all make intuitive sense), we focus on the remodeling effects We provide estimated function values of k(t) and m(t) for specific postremodeling weeks However, a complete assessment of the remodeling effects requires plotting the entire functions Therefore, in Figure 1, we depict the estimated functions k(t) and m(t), along with a 95% confidence band for the 55 weeks after the remodeling As we indicated previously, the

TABLE 3
Effects on Average Customer Spending and Store Traffic

	Average Customer Spending		Store Traffic	
Parameter	Estimate[a]	(SE)	Estimate[a]	(SE)
Remodeling Effects				
2nd postremodeling week	– 002	(014)	– 003	(031)
10th postremodeling week	037**	(010)	– 014	(017)
18th postremodeling week	036**	(010)	– 032	(017)
26th postremodeling week	002	(009)	– 027	(016)
34th postremodeling week	– 007	(009)	– 026	(016)
42nd postremodeling week	007	(010)	– 053*	(017)
50th postremodeling week	– 000	(011)	– 078**	(020)
Control Variables				
Construction period	002	(015)	– 155**	(024)
Promotion	032**	(005)	048**	(009)
Public holiday	024**	(006)	020	(011)
School vacation	009	(009)	– 031	(016)
Adjusted R^2	999			

*$p <$ 05 (all tests are two-sided)
**$p <$ 001
[a] Because the dependent variables are in log form, the parameter estimates can be interpreted as percentage changes in average customer spending or store traffic

function values of k(t) and m(t) can be interpreted as percentage changes in average spending and store traffic, respectively. We find that the changes in average customer spending and store traffic are remarkably different.

For average customer spending (Figure 1, Panel A), we observe a significant short-term increase that disappears in the long run, in line with the response pattern hypothesized in H_1 and H_2. Specifically, average customer spending increases significantly ($p < .05$) between Weeks 7 and 22 after the remodeling, by a maximum of 4.4% in Week 14. Indeed, between Weeks 7 and 22, 0 does not fall within the confidence interval. However, in the long run (starting six months after the remodeling, approximately Week 27), average spending per customer returns to the baseline, and the observed effects are no longer significant, in line with adaptation-level theory. Overall, the trajectory of spending effects is similar to the patterns of our cognitive and behavioral intention measures, which suggests that these measures are useful predictors of customers' actual in-store behavior.

Store traffic exhibits a substantially different pattern (Figure 1, Panel B). In contrast with average spending, store traffic does not change significantly in the short run. Unexpectedly, it even declines in the long run, resulting in a significant dip in Weeks 37–54. Although store traffic recovers again toward the end of our observation period, these results offer an important warning for companies that plan to use remodeling to improve their store patronage. A possible explanation is that the store remodeling triggered persistent negative effects as some customers switched to other stores during the remodeling and continued this behavior afterward. Alternatively, the remodeling might have elicited reactance against the new servicescape among consumers who felt deprived of their freedom to visit their familiar store (Brehm and Brehm 1981). In the short run, these negative effects might have been compensated for by positive curiosity effects in other customer segments, such that the negative impact only emerges in the long run.

The results for store traffic are not in line with H_1 and H_2 but support our expectation that the remodeling effect on store traffic is lower than that on average spending (H_5). One-sided t-tests indicate that from Week 8 to Week 26 and from Week 37 to Week 54, the difference between the percentage impact on store traffic and that on average spending is significant ($p < .05$).[9]

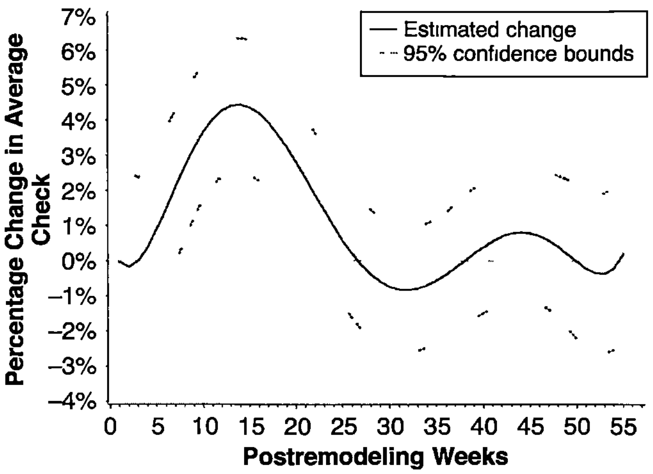
Validation

One crucial finding of our analyses is that short-term remodeling effects wear off over time, in line with adaptation-level theory. To validate this result, we (1) analyze revenue data from 18 stores, (2) conduct a laboratory study, and (3) gather qualitative insights.

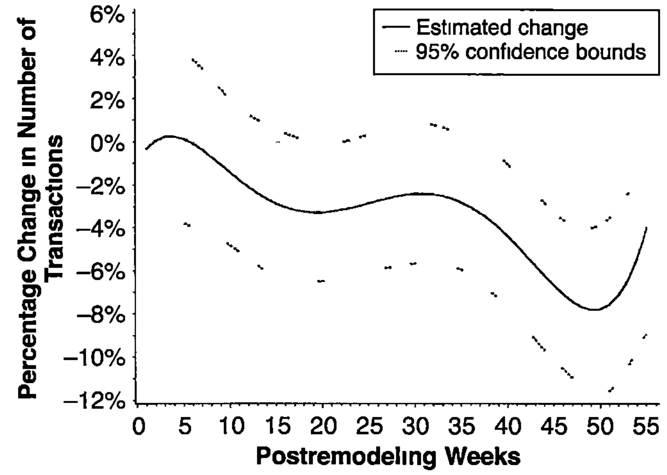
Revenue analysis. We analyze weekly revenue data from 18 restaurants (including the two stores of our main

FIGURE 1
Effects of Remodeling on Store Performance

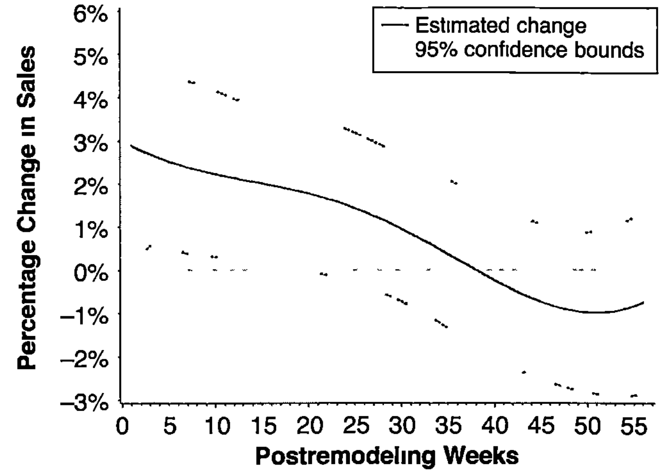
A: Effects of Store Remodeling on Average Customer Spending



B: Effects of Store Remodeling on Store Traffic



C: Validation: Effects of Store Remodeling on Revenue (18 stores)



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[9] Because in each week the difference between spending and store traffic effects is a linear combination of the estimated parameters of the polynomials, we can derive the difference's standard error from the variance–covariance matrix of those parameters und use this standard error in the t-test.

study), covering the same 92 weeks as the data in our main study. Of the 18 restaurants, 6 were remodeled. For each remodeled store, we include 2 control stores to obtain reliable estimates of the baseline revenue (Shadish, Cook, and Campbell 2002). To select these control stores, we use the same matching criteria (post hoc) used in our main study. We model revenue as an exponential function, identical to the functional forms of AS_{it} and ST_{it} in Equations 1 and 2. As we did previously, we control for the effects of promotions, vacations, holidays, and the remodeling period, include store-specific intercepts, and accommodate the dynamic effects with sixth-degree polynomial time functions (which resulted in the highest adjusted R-square). We include six baseline polynomials, one for each treatment restaurant and its two control stores, to capture revenue fluctuations not due to the remodeling. Finally, we add a polynomial to assess incremental changes as a result of the remodeling, pooled across the six treatment stores.

To save space, we do not report store intercepts, baseline patterns, or the effects of the control variables. In Figure 1, Panel C, we portray the estimated remodeling effects, along with a 95% confidence band for up to 56 weeks after the remodeling.[10] Revenue significantly increases by 2%–3% ($p < .05$) during the first 20 weeks but then returns to its normal level, lending extra support to the relevance of adaptation-level theory for the context of servicescape remodeling.

Lab study. To validate the adaptation mechanism more explicitly, we conducted a computer-based lab study comparable to the study by Russell and Lanius (1984), who also examine environmental adaptation-level effects. One hundred ninety-seven student respondents watched a two-minute video clip of a visit to the remodeled store that provided a realistic impression of the new store design. After watching the clip, respondents completed a five-point single-item scale that measured their general impression of the store environment. In addition, they provided sociodemographic information and indicated whether they usually visit a restaurant with a new (n = 91) or old (n = 106) store design. In an analysis of covariance in which we control for gender (all students belong to the same age category), we find that respondents rate the remodeled design shown in the video clip significantly higher ($p < .01$) when they usually visit a store with the old, as opposed to the new, design. That is, people who are already familiar with the new store environment use a higher standard to evaluate the new environment because they integrate their prior experience with the new servicescape into their adaptation level.

Qualitative insights. To further substantiate the adaptation-level rationale, we collected spontaneous reactions to the remodeled servicescape from 91 students who participated in a computer-based lab study. Respondents first saw a slide show of the new store design and then wrote down their thoughts and perceptions of the store environment, provided sociodemographic information, and indicated whether they usually visit a restaurant from this chain with the new (n = 43) or old (n = 48) store design. Three independent coders content-analyzed and classified the responses. The results indicate 644 pairwise agreements out of a total of 801 possible, resulting in an interjudge agreement of .80. The proportional reduction in loss reliability measure is greater than .97, which leaves us fairly confident about our judges' classification.

Table 4 presents the counts and percentages for response categories mentioned by more than 5% of the respondents. While several associations with the remodeled store are mentioned by both new-store and old-store visitors (e.g., "modern/trendy," "clean," "child-friendly," "fast food"), we observe notable differences. Respondents who usually visit a remodeled store mention "standard," "familiar," "typical," "recognizable," or "normal" much more often than respondents who usually visit a nonremodeled store. In addition, new-store visitors typically refer to "design" in general, while old-store visitors emphasize the newness of the design and are much more likely to find the new design modern or trendy. Thus, in general, respondents' unaided thoughts support the adaptation-level explanation.

Discussion

Main Findings and Theoretical Implications

In this study, we used a natural experiment in a fast-food chain to investigate the effects of store remodeling on customers' cognitions, affect, and behavioral intentions and on actual store performance. Our findings, which we summarize in Table 5, contribute to servicescape literature in at least three ways. First, whereas prior literature has not addressed the temporal effects of changes in the ser-

TABLE 4
Respondents' Unaided Thoughts in Reaction to the Remodeled Servicescape

Category	Count	%
Evaluation by Respondents Who Usually Visit Stores with the Old Design		
Modern/trendy	35	73
New interior design	22	46
Clean	13	27
For children/child-friendly	12	25
More of a restaurant and not fast food	10	21
Fat/unhealthy food/low quality	8	17
Fast food	7	15
Evaluation by Respondents Who Usually Visit Stores with the New Design		
Modern/trendy	24	56
Design	22	51
Clean	19	44
Standard/familiar/typical/recognizable/normal	13	30
Nice environment/nice atmosphere	12	28
Fast food	11	26
Colors, colorful	10	23
For children/child-friendly	9	21

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[10] These results rely on observations for all six remodeled restaurants. Any estimated effects after the 56th week only pertain to two restaurants for which a longer postremodeling time span was available because these restaurants were remodeled earlier in the observation period. These effects are somewhat more erratic but not significant.

TABLE 5
Summary of the Main Findings

Short- versus long-term effects (H_1 and H_2)	•Store remodeling has a short-term impact on cognitive (perceived value, store image) and behavioral measures (loyalty, desire to stay, word-of-mouth), but not on affective measures. •Short-term remodeling effects lose strength in the long run, in line with adaptation-level theory.
Moderating effects (H_3 and H_4)	•Spontaneous visits tend to lead to greater remodeling effects than planned visits, especially in the short run (e.g., perceived value, overall satisfaction, word-of-mouth communication). •Customers in a group tend to respond more positively to a store remodeling than single customers, especially in the long run (e.g., perceived service quality, overall satisfaction, word-of-mouth communication).
Effects on customer spending versus store traffic (H_5)	•The remodeling effect on store traffic is less than that on average spending. •In line with H_1 and H_2, average spending increases in the short run but returns to the baseline in the long run. •Store traffic does not change in the short run and even shows a dip in the long run.

vicescape, we disentangle the short- and long-term effects of store remodeling and present adaptation-level theory as an important theoretical concept for studying changes in the servicescape over time. Most of our short-term results provide real-life validation of previous laboratory experiments that reveal consumers' positive reactions to an attractive store environment (e.g., Baker, Grewal, and Parasuraman 1994). For example, we observe positive short-term effects on cognitive measures, such as store image, and behavioral intentions, such as word-of-mouth communication. However, in line with adaptation-level theory, the positive short-term effects tend to lose strength in the long run (i.e., after six months) as the remodeled store becomes the new frame of reference.

Second, our research is one of only a few studies that shed light on the interaction between servicescape effects and store visit characteristics. Our results indicate that customers who visit the store spontaneously are typically more receptive to the influence of the remodeling than are customers who planned their visit. Furthermore, customers who visit in groups tend to respond more favorably to the remodeled servicescape than single customers do. Previous work has found contagion effects between employees and customers (e.g., Hennig-Thurau et al. 2006), our findings suggest that similar mechanisms may exist among customers in the context of a remodeled servicescape.

Third, servicescape research traditionally has investigated consumer responses upon exposure to the store environment, but this singular reliance on in-store reactions may generate an incomplete picture of the likely effects on store performance. We observe that customer spending, which occurs in the store, exhibits a response pattern similar to those of most of our survey measures. It increases shortly after the remodeling and returns to the baseline in the long run. In contrast, store traffic is less prone to the influence of the servicescape because the decision to visit the store naturally occurs outside the store. Store traffic remains unaffected by a remodeled servicescape in the short run and even indicates a negative effect in the long run. Perhaps the remodeling period interrupts habitual behaviors and makes some people identify and switch to other stores. Alternatively, remodeling may trigger reactance effects among certain consumers who deliberately stay away. In any case, this finding warrants further research.

Finally, beyond these three main contributions, two additional findings deserve attention. First, though tapering over time, the remodeling impact on store image and desire to stay remains significant in the long run. Both constructs are likely to benefit directly from the improvements in store perception, which, as shown in our manipulation test, remain significant across time. Similarly, our qualitative study (see Table 4) suggests that even consumers who are already familiar with the remodeled store (and therefore describe the new servicescape as "standard," "typical," and so forth) still appreciate the "nice environment" and refer to it as "modern" and "trendy."

Second, the affective responses of the average customer (overall satisfaction, encounter satisfaction, and attitude) remained unaffected by a store remodeling in both the short and long run. These findings could indicate that satisfaction and attitude depend more on the entire consumption experience to which other variables (e.g., product characteristics) contribute to a greater extent than the servicescape (Szymanski and Henard 2001). Another plausible explanation may be that the new servicescape improved the dining experience but also raised expectations (see Sharma and Stafford 2000). In an expectation–disconfirmation framework, satisfaction and attitude would stay at their preremodeling levels, because expected and experienced performance increased to the same extent (cf. Bitner 1992). Thus, although customer satisfaction is often used as a proxy for store performance, it cannot always tell the entire story.

Managerial Implications

General implications for marketing and store managers. At least in the short run (i.e., within six months after a remodeling), managers can use store remodeling to improve store image and value perceptions. Remodeling also may induce behavioral responses, such as longer store visits, increased spending, greater loyalty, and more word-of-mouth communication However, our findings entail several caveats for managers considering a remodeling of their servicescapes First, we warn against a myopic approach to store remodeling If firms fail to realize that customer reactions lose strength in the long run, they may overstate the total impact of the remodeling Therefore, companies should thoroughly investigate possible remodeling effects over time before rolling out new store designs However, techniques that consider only short-term effects appear popular in practice For example, Office Depot used secret laboratory stores to develop and evaluate its Millennium 2 store concept, admitting that "only time will tell how successful these efforts will be in the eye of the customer" (Jeffries and Eisenberg 2005) The personal computer manufacturer Gateway pilot-tested its new store design in mid-2003 and then completed the remodeling of all its stores just three months later (Goliath 2003) Our findings indicate that it is more appropriate to assess performance in one or more pilot stores for a relatively long period In our focal industry, fast-food restaurants, an observation period of approximately one year seems warranted

Second, our results imply that the impact of remodeling may vary across industries Remodeling may lead to greater effects in retail sectors in which store visits tend to be rather spontaneous, such as card and gift stores, compared with sectors in which planned visits prevail, such as supermarkets In addition, remodeling may be more rewarding for industries in which customers often are part of a group, such as cafés, but less so for industries in which customers come alone, such as cybercafés In a similar vein, our results indicate that not all stores in a chain will benefit equally from remodeling For example, a chain of coffeehouses rolling out a new store design may give priority to a Main Street store that attracts small parties of consumers who spontaneously interrupt their shopping trips for a coffee break rather than to a store that caters to commuters who pick up their regular morning coffee on their way to work

Third, although customers spend more shortly after a store makeover, store traffic might not increase Therefore, companies should apply other marketing tactics to stimulate consumers to come in and, once exposed to the new servicescape, spend more money This finding creates an interesting trade-off Providing incentives to visit the store, such as coupons, lures consumers into the store but also causes them to plan their visit (Kahn and Schmittlein 1992), which may decrease the impact of the servicescape In this respect, mass advertising may be more appropriate because it increases store awareness without necessarily affecting the nature of store visits

Implications for franchisor–franchisee relationships In the fast-food and many other service industries, franchise chains represent the largest share of total sales (Michael 1999) As we show, our results also have implications for the relationships between franchisor and franchisees Specifically, the interests of these two parties in the remodeling may not align perfectly, which is consequential for the allocation of remodeling costs

For the franchisor, who receives royalties on the franchisees' gross revenues, positive remodeling effects on store revenues generate extra proceeds We find that store revenues increase by up to 3% in the first months after the remodeling For the treatment store in our main study, which has close-to-average baseline revenues, the percentage effects translate into a cumulative revenue increase of approximately €28,000 For a chain of some thousand stores and a typical royalty of 10% (Michael 1999), the incremental income thus would represent a few million euros Other benefits for the franchisor cannot be expressed directly in terms of revenues For example, the chain might use store remodeling to boost image in the short and long run Indeed, we find that the initial impact on store image, though it tapers off, remains significant in the long run Such improvements in store image may help franchisors solidify their position in the market and generate financial payoffs in the very long run (for which our analysis does not account) A significant remodeling also could be an important signal to shareholders that underscores the company's commitment to customer relevance, which may lead to increased stock prices

In contrast, franchisees seek to maximize the profits of their individual stores and want to recoup any investment within a reasonable amount of time (Gogoi, Arndt, and Moiduddin 2006) To evaluate the gains from remodeling, franchisees consider both incremental store revenues and savings in maintenance costs (e g , chair replacement, wall redecoration) For example, in addition to a revenue increase of €28,000, the treatment store in our main study realized annual maintenance savings of about €4,000, at least in the first few years after the store redesign If we assume a food cost of 25% (common for this business) and ignore discounting, the gross return on a five-year basis would be (1 – 25) × €28,000 + 5 × €4,000 = €41,000 In this way, individual franchisees can derive their maximum willingness to contribute to the remodeling effort Because absolute remodeling effects depend on the store's baseline revenues, this willingness to contribute will vary greatly across stores

Thus, we recommend careful and store-specific allocations of remodeling costs For the remodeling program we studied, franchisees shouldered the lion's share of the costs, typically a multiple of the estimated increases in store profits If the franchisor wants to speed up the rollout of the remodeled servicescape, it could identify costs that it can shift to the franchisee while ensuring there is a clear incentive for the franchisee to implement the new design Moreover, the franchisor should make franchisees aware of effects that are more difficult to quantify, such as the long-term implications for store image Remodeling also can have a positive impact on employee behavior, leading to greater productivity and lower turnover (see Parish, Berry, and Lam 2008), or it may serve as an entry deterrent that lowers the expected profits of a rival firm considering entry into the market

Limitations and Further Research

Because this work represents a first study of the effects of a remodeled servicescape, ample opportunity remains for further research First, field experiments have their own limitations, the most important being that it is not possible to control all factors. Although we carefully selected the stores and tried to avoid extraneous influences, we cannot completely rule out confounding effects of the environment. Furthermore, a field experiment involves only one specific setting. For the sake of generalizability, studies should examine whether our findings hold for other remodeling projects, and in contexts other than fast-food restaurants. The impact of store remodeling may be more persistent in fashion-oriented or upscale stores or in industries in which the servicescape forms the core of the service offering (e.g., hotels).

Second, although the results of our lab studies and qualitative analysis support the adaptation-level rationale, there may be other reasons for the waning remodeling effects. For example, the positive remodeling effects may diminish over time as the new store design loses its initial cleanliness. Further research might validate this and other explanations.

Third, researchers might examine interactions between store remodeling and other variables. Additional work could investigate whether remodeling effectiveness is moderated by other marketing interventions, such as altered product offerings or advertising. It may also be worthwhile to include other store visit characteristics. Research might explicitly distinguish between hedonic and task-oriented store visits (Kaltcheva and Weitz 2006), particularly to investigate the extent to which these motivations drive the observed differences for spontaneous versus planned and group versus single-customer visits.

Fourth, although we assess remodeling effects at different levels (cognitive, affective, and behavioral), another model could explicitly distinguish consecutive decision stages (e.g., awareness, consideration, trial, consumption, and postconsumption evaluation) and measure remodeling effects on each. Such an analysis could add conceptual and managerial insights. For example, if the impact on consideration appears greater, marketing efforts should focus on converting this increased consideration into trial.

Fifth, researchers could decompose store traffic and revenue effects to clarify the underlying mechanisms. For store traffic, it would be helpful to decompose the effects in changes in visit frequencies and changes in the size of the customer base. To this end, researchers could obtain average visit frequencies from customer respondents and compare the frequency distributions between stores and across time. Store traffic effects that cannot be attributed to changes in visit frequencies would be due to an expansion of the customer base. As for revenue, panel data would enable researchers to track individual customers over time and split the effects into revenues generated by new customers (after remodeling) and those from existing customers (see Sloot, Fok, and Verhoef 2006).

APPENDIX A
Examples of Changes in Studied Servicescape

Servicescape Characteristic	Before	After
Ambience		
Lighting	Lighting before included sterile, bright, neon lights.	The new interior servicescape has a contemporary, warm lighting scheme including dimmed lights and spots to highlight paintings, the entrance to the restrooms, and special constructions like a pillar in the middle of the restaurant. Better, clearer light is used in the counter area and for the menu displays, and shutters in front of five windows create a cozier atmosphere.
Color schemes	The walls inside were white, the chairs were a beech color. The tables were grayish blue, the ceiling was white, and the floor was a speckled off-white. The outside walls were white and had three blue stripes and blue skirting. The roof was red.	The walls are now dark brown and gray, the chairs auburn, gray, off-white, and ocher. The tables are now yellow and dark brown, the ceiling is gray, and the floor has a light terracotta color, some parts of the floor are highlighted in gray and yellow. The outside walls are now orange, the roof is gray, and the fence is silver.
Space/Functionality		
Layout	The old store consisted of one large room and a children's corner. Tables were set apart by wooden flower boxes.	In the new design, the store is divided into distinct zones such as the "flexible" zone for everyone or the "grab and go" zone that features tall counters with bar stools for customers who eat alone.
Furnishing	The previous furniture included traditional chairs and bench seats.	In the new design, there are a variety of seating options, including higher benches, chairs, bar stools, and cantilever chairs. Instead of wooden chairs and cloth, the new servicescape furniture features leather seats and stainless steel.
Signs, Symbols, and Artifacts		
Paintings	The old design featured white walls with wainscots on the lower part. The walls also contained a few abstract and lighthouse paintings that had no relation to the store or the color schemes.	The new paintings assimilate the same colors as the rest of the store (yellow, gray, brown, red). The paintings display famous landmarks or landscape shots in an abstract way.

APPENDIX B
Results of CFA

Response Measures	Standardized Factor Loadings*
Cognitive Responses	
Perceived Value (Cronin et al 1997) (SB corrected r = 78, CR = 76)	
1 ______ offers good service for the price	77
2 ______ makes me feel that I am getting my money's worth	81
Perceived Service Quality (Hightower, Brady, and Baker 2002) (SB corrected r = 76, CR = 76)	
1 Overall, I have received high quality service at ______	76
2 Generally, the service provided at ______ is excellent	81
Store Image (Graeff 1996) (α = 68, CR = 71)	
How would you describe the image of this ______ restaurant?	
1 Modern/old-fashioned (reversed)	37
2 Dull/interesting	57
3 Unsophisticated/sophisticated	81
4 Economical/extravagant	68
Affective Responses	
Overall Satisfaction (Bitner and Hubbert 1994) (SB corrected r = 64, CR = 62)	
1 Based on all my own experiences, I am satisfied with ______'s services	70
2 Compared to other fast-food restaurants I have been to, I am satisfied with ______	65
Encounter Satisfaction (Bitner and Hubbert 1994) (SB corrected r = 91, CR = 92)	
1 I feel delighted about my service experience today	93
2 I am satisfied with today's service experience	91
Attitude (Day and Stafford 1997, Muehling, Laczniak, and Stoltman 1991) (SB corrected r = 83, CR = 83)	
How would you describe your general feelings toward ______?	
1 Good/bad (reversed)	83
2 Positive/negative (reversed)	81
3 Favorable/unfavorable (reversed)	72
Behavioral Intentions	
Loyalty (McMullan 2005, Zeithaml, Berry, and Parasuraman 1996) (α = 75, CR = 80)	
1 I consider myself a loyal customer of this ______ restaurant	78
2 I consider ______ as my first choice when selecting fast-food	53
3 I consider myself a loyal customer of ______ in general	85
Desire to Stay (Hightower, Brady, and Baker 2002, Wakefield and Blodgett 1996)(SB corrected r = 83, CR = 82)	
1 I enjoy spending time at this ______	85
2 I like to stay in this ______ restaurant	82
Word-of-Mouth Communication (McGregor 2006, Reichheld 2003, Zeithaml, Berry, and Parasuraman 1996) (α = 87, CR = 84)	
1 I am likely to say positive things about this ______ restaurant to other people	75
2 I am likely to recommend this ______ restaurant to a friend or colleague	74
3 I am likely to say positive things about ______ in general to other people	79
4 I am likely to encourage friends and relatives to eat at ______	74

*All (free) loadings are significant at the $p <$ 001 level (two-sided)

Notes SB corrected r = Spearman-Brown corrected correlation, and CR = composite reliability Model fit $\chi^2(213)$ = 1747 54, $p <$ 01, CFI = 98, TLI = 97, NFI = 97, and RMSEA = 055

APPENDIX C
Results of MANCOVA: Impact of Remodeling on Servicescape Perceptions

	Estimated Interaction Coefficients (STORE × WAVE)[a]		
	Short Term		Long Term
Servicescape Perception	2nd Wave	3rd Wave	4th Wave
In general, the environment pleases me	1 297***	1 864***	1 457***
The external appearance is welcoming	730***	1 247***	846***
The interior design is contemporary	1 121***	1 680***	1 358***
The furniture inside the restaurant appeals to me	1 281***	1 913***	1 512***
The furniture outside the restaurant is appealing	387*	841***	516**
The physical facilities are comfortable	1 206***	1 581***	1 134***
The restaurant has more than enough space for me to feel comfortable	670***	834***	678***
I like the interior layout of this restaurant	681***	911***	614***

APPENDIX C
Continued

Servicescape Perception	Estimated Interaction Coefficients (STORE × WAVE)[a]		
	Short Term		Long Term
	2nd Wave	3rd Wave	4th Wave
The wall decorations are fashionable	920***	947***	837***
The atmosphere is warm	359*	474**	922***
The lighting is comfortable	119	223	195
The colors of the exterior are pleasing	281	752***	403*
The colors of the interior are pleasing	858***	1 177***	861***

$^{*}p < 05$ (all tests are two-sided)
$^{**}p < 01$
$^{***}p < 001$
[a] These coefficients capture the extent to which the difference in perceptions between the treatment and control store increases (+) or decreases (–) compared with the wave before the remodeling For example, a coefficient of 1 297 in Wave 2 indicates that the difference in perception between the treatment and control store increases by 1 297 compared with Wave 1
Notes Wilks' Λ = 895, F(39, 8031 6) = 7 830, $p < 001$, partial η^2 = 04

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The Impact of Brand Quality on Shareholder Wealth

This study examines the impact of brand quality on three components of shareholder wealth stock returns, systematic risk, and idiosyncratic risk The study finds that brand quality enhances shareholder wealth insofar as unanticipated changes in brand quality are positively associated with stock returns and negatively related to changes in idiosyncratic risk However, unanticipated changes in brand quality can also erode shareholder wealth because they have a positive association with changes in systematic risk The study introduces a contingency theory view to the marketing–finance interface by analyzing the moderating role of two factors that are widely followed by investors The results show an unanticipated increase (decrease) in current-period earnings enhances (depletes) the positive impact of unanticipated changes in brand quality on stock returns and mitigates (enhances) their deleterious effects on changes in systematic risk Similarly, brand quality is more valuable for firms facing increasing competition (i e , unanticipated decreases in industry concentration) The results are robust to endogeneity concerns and across alternative models The authors conclude by discussing the nuanced implications of their findings for shareholder wealth, reporting brand quality to investors, and its use in employee evaluation

Keywords brand quality, stock returns, idiosyncratic risk, systematic risk, earnings, industry concentration, marketing–finance interface

Perceived brand quality represents consumers' view of how well a brand meets their requirements and expectations (Mitra and Golder 2006) Firms devote significant resources to quality improvement programs and staff training (Rust, Zahorik, and Keiningham 1995) and voluntarily provide quality information (Guo and Zhao 2009) to improve consumer perceptions of brand quality [1] Managers are also likely to align their pricing and advertising strategy (e g , charge higher prices and place advertisements in high-quality media vehicles) to increase brand quality (see also Kopalle and Lehmann 2006) Senior managers also discuss brand quality with investors For example, recently, the executive vice president of Target Inc identified improvements in brand quality as the reason for better performance (Earnings Conference Call, November 17, 2009) Given its managerial importance, it is vital to understand the effect of brand quality on shareholder wealth, as reflected in stock returns and the systematic and idiosyncratic risk of stock returns

While extant literature examines the impact of brand quality on stock returns, it is relatively silent about its impact on the systematic and idiosyncratic risk of stock returns (see Table 1) For example, while Mizik and Jacobson (2004) examine the effects of brand quality on stock returns, they do not study its impact on risk More recently, Mizik and Jacobson (2008) examine the impact of a related construct, brand esteem, on stock returns, but again they do not study its impact on risk Directly related to risk, Rego, Billet, and Morgan (2009) find that consumer-based brand equity is associated with lower systematic and idiosyncratic risk

Brand quality is conceptually distinct from both brand esteem and consumer-based brand equity Brand quality is an important but distinct dimension of brand esteem, leadership, regard, and reliability are others (Mizik and Jacobson 2008) Similarly, brand quality is conceptually distinct from consumer-based brand equity, which includes other dimensions, namely, awareness, purchase intentions, and distinctiveness (Rego, Billet, and Morgan 2009) Indeed, brand quality is considered a distinct and valuable marketing asset (e g , Keller and Lehmann 2006, Rust et al 2004) That brand quality is a distinct construct is also reflected in literature that specifically examines its antecedents (e g , Guo and Zhao 2009, Kopalle and Lehman 2006) and consequences (see Table 2)

Taken together, the current literature leaves us with a somewhat incomplete picture of the joint impact of brand quality on *both* stock returns and risk Research needs to examine both these components of shareholder wealth

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[1] For ease of exposition, we use "brand quality" in place of "perceived brand quality" from this point onward

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TABLE 1
The Impact of Brand Quality and Related Constructs on Shareholder Wealth

Study	Construct Examined	Components of Shareholder Wealth			Moderators Identified
		Stock Returns	Systematic Risk	Idiosyncratic Risk	
Aaker and Jacobson (1994)	Brand quality	Significant, positive effect	Not examined	Not examined	Not examined
Mizik and Jacobson (2004)	Brand quality	Significant, positive effect	Not examined	Not examined	Not examined
Mizik and Jacobson (2008)[a]	Brand esteem	Effect is not significant	Not examined	Not examined	Not examined
Rego, Billet, and Morgan (2009)[b]	Consumer-based brand equity	Not examined	Significant, negative effect	Significant, negative effect	Not examined
Current study	Brand quality	Significant, positive effect	Significant, positive effect	Significant, negative effect	Unanticipated changes in current-period earnings and industry concentration

[a] Mizik and Jacobson (2008) also examine the impact of other brand attributes, such as differentiation, relevance, knowledge, and energy on stock returns.

[b] Rego, Billet, and Morgan (2009) examine the impact of consumer-based brand equity on different components of stock returns risk. Consumer-based brand equity is a higher-order construct comprising multiple dimensions, namely, quality, awareness, distinctiveness, and purchase intentions.

TABLE 2
Outcomes of Brand Quality

Study	Key Finding
Brand Quality and Consumer Choice	
Steenkamp, Batra, and Alden (2003)	Perceived brand quality is positively related to purchase likelihood
Erdem, Swait, and Valenzuela (2006)	Across seven countries, perceived brand quality has a strong positive impact on consumer intentions to purchase a brand
Swait and Erdem (2007)	Perceived brand quality is a strong determinant of whether a brand is even in the consideration set of the customer
Brand Quality and Price	
Dhar and Hoch (1997)	Consumers price sensitivity matters less for high-quality brands
Randall, Ulrich, and Reibstein (1998)	Perceived brand quality allows a brand to command significant price premiums
Sullivan (1998)	Consumers pay higher prices for high-quality brands even though the production platform of the car might be the same
Erdem, Keane, and Sun (2008)	Perceived brand quality is positively related to price and frequent price cuts lower perceived brand quality
Dubé et al. (2008)	Higher perceived brand quality yields greater long-term profitability from consumer loyalty. This is because over the long run, loyal consumers will pay more for the higher-quality brands
Brand Quality and Marketing Initiatives	
Allenby and Rossi (1991)	Price promotions are more effective for high-quality brands
Sivakumar and Raj (1997)	Brands with high perceived quality derive greater benefits from price promotions in terms of consumer decision to purchase from a category and the choice of brand within the category Brands with higher perceived quality are less affected by increases in prices
Boulding, Kalra, and Staelin (1999)	Consumers' perceptions of brand quality influence their evaluations of a firm's marketing actions. Specifically, the higher the perceived brand quality, the greater is the effectiveness of marketing actions
Shaffer and Zhang (2002)	Price promotions are more beneficial for firms with higher perceived brand quality
Srinivasan et al. (2009)	New product introductions are more valued by stock markets for products with higher perceived quality
Brand Quality and Firm Performance	
Aaker and Jacobson (1994)	Changes in perceived brand quality are positively related to stock returns
Mizik and Jacobson (2004)	Changes in perceived brand quality are positively related to stock returns
Balachander and Stock (2009)	High-quality brands are likely to yield higher profits by offering limited-edition products

because while an asset might increase stock returns, it could also increase the risk of stock returns (e g , Osinga et al 2011, Tuzel 2010) As the global financial crises of 2008 demonstrate, investors and managers that judge performance *only* in terms of stock returns are likely to place more resources than warranted in risky opportunities and apply misguided performance evaluations (Markowitz 1952, 1959) Accordingly, the current study has two objectives and seeks to make the following contributions

First, we jointly examine the impact of "unanticipated changes" in brand quality on *both* stock returns and the changes in the systematic and the idiosyncratic risk of stock returns Unanticipated changes in brand quality refer to the changes in brand quality that investors did not expect[2] The focus on unanticipated changes is consistent with the efficient market hypothesis that investors react only to new (unanticipated) information and all other information is already reflected in the current stock price (see Mizik and Jacobson 2004)

We test our hypotheses using a stock response model and a difference in risk metrics model on a database of 132 firms from multiple industries spanning a period of six years (2000–2005) The results highlight the importance of considering the risk *and* return implications of unanticipated changes in brand quality We find that unanticipated changes in brand quality are positively associated with stock returns and negatively associated with changes in idiosyncratic risk However, unanticipated changes in brand quality are also positively associated with changes in systematic risk, that is, unanticipated increases (decreases) in brand quality can make stock returns more (less) sensitive to stock market movements These results are salient for marketing managers for whom it is important to articulate the impact of marketing assets to senior management, investors, and analysts (see Swaminathan and Moorman 2009)

Second, we hope to provide a richer understanding of the impact of unanticipated changes in brand quality on shareholder wealth by highlighting the moderating role of unanticipated changes in current-period earnings and industry concentration We achieve this objective by developing hypotheses that integrate theoretical perspectives from accounting (e g , Graham, Harvey, and Rajgopal 2005) and finance (e g , Hou and Robinson 2006) with current literature on the marketing–finance interface (e g , Bahadir, Bharadwaj, and Srivastava 2008) As such, this study is responsive to recent calls to identify factors that moderate the effects of marketing assets on financial metrics (e g , Kimbrough and McAlister 2009)

Consistent with the moderator hypotheses, we find that an unanticipated increase in current-period earnings enhances the positive impact of unanticipated changes in brand quality on stock returns but mitigates their deleterious effects on changes in systematic risk Unanticipated changes in brand quality are also more valuable in more competitive industries (i e , with unanticipated decreases in industry concentration) because their positive effects on stock returns are stronger and their deleterious effects on systematic risk are weaker in such industries These results are of direct import to senior managers and analysts because they identify conditions under which investors are more or less responsive to unanticipated changes in brand quality

Related Literature

Literature examining the financial performance impact of brand characteristics has a rich empirical precedence Early work by Horsky and Swyngedouw (1987) examines the financial market impact of firm name changes (see also Lane and Jacobson 1995) Research using data on brand value from *Financial World* magazine provides preliminary evidence of a positive association with firm market value (Kerin and Sethuraman 1998) Empirical research also shows that firm value as represented by Tobin's q is positively related to corporate branding strategy (Rao, Agarwal, and Dahlhoff 2004) and brand portfolio strategy (Morgan and Rego 2009)

A second stream of research explores the specific impact of brand quality on several consumer behavior and firm performance metrics (see Table 2) A focus on how brand quality affects financial performance is important because of the central role it plays in marketing strategy For example, marketing communications to enhance the perceived quality of a brand require higher investment in advertising, alignment of the communication with high-quality media vehicles, and a significant amount of time (see Mitra and Golder 2006)

As shown in Tables 1 and 2, prior studies on the financial outcomes of brand quality have focused primarily on stock returns, with little examination of the risk of stock returns In addition, prior studies have predominantly examined main effects and have not explored contingencies Examining contingencies is critical for theory development and also better informs management practice Accordingly, we develop hypotheses about the effect of unanticipated changes in brand quality on shareholder wealth and the moderating role of unanticipated changes in current-period earnings and industry concentration

Hypotheses

Stock Returns

Stock returns represent investors' expectations about a firm's future cash flows Prior research has identified three key reasons for an unanticipated increase (decrease) in brand quality to be a signal of higher (lower) future cash flows (see Table 2) First, as quality increases, brands have a greater likelihood of being purchased and repurchased because it signals an increase in brand's credibility and reduces customers' perceived risk and information costs (Erdem, Swait, and Valenzuela 2006) In turn, this impact on purchase and repurchase leads to greater future cash flows Second, cash flows also increase because consumers are willing to pay premium prices for higher-quality brands (see Table 2) Third, marketing actions such as promotions and advertising are more effective for higher-quality brands As a result, an increase in brand quality signals potential costs savings, leading to higher future cash flows Thus

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[2] Unanticipated changes in brand quality do not mean that these changes are random and that managers did not work toward changing brand quality Managers do take initiatives that may not be visible to investors As a result, outcomes of such initiatives (e g , an increase in brand quality) are unanticipated for investors and thus are not yet incorporated in the stock price

H_1 Unanticipated changes in brand quality are positively related to stock returns

Systematic Risk

Systematic risk is the degree to which stock returns covary with the stock market returns Firms that cushion themselves from the impact of stock market movements and deliver consistent cash flows enjoy lower systematic risk (McAlister, Srinivasan, and Kim 2007) Extant literature suggests competing arguments about the effect of unanticipated changes in brand quality on changes in systematic risk the loyalty argument and the price premium argument

Loyalty argument Because an increase in quality increases the probability of a customer choosing and continuing to purchase the brand (i e , it engenders brand loyalty, see, e g , Dubé et al 2008), it is likely to cushion the impact of market downturns on cash flows During a downturn, as demand declines and cash flows of all firms are adversely affected, customers are likely to be tempted with competitive offers through extensive promotions However, loyal customers are less likely to be tempted by such offers (see Raju, Unnava, and Montgomery 2009) Thus, by fostering brand loyalty, increases in brand quality help firms attract and retain customers during a market downturn Therefore, the expected cash flows of such firms are less affected by downturns In contrast, a firm with a decline in brand quality suffers decreases in cash flows not only because of marketwide factors but also because of the loss of customers That is, the firm's future cash flows, and thus its stock returns, are more sensitive to market downturns Thus

H_2 Unanticipated changes in brand quality are negatively associated with changes in systematic risk

Price premium argument A recent study argues that it is difficult for firms to sell high-quality brands at prices that consumers will perceive as low (Morgan and Rego 2009) This is consistent with the argument that higher-quality products/services cost more to produce because firms need to use better (and thus more expensive) inputs, such as high-quality ingredients, and hire better-qualified employees who demand higher wages (Rust, Moorman, and Dickson 2002) Higher brand quality is not only viewed by consumers as a signal of higher price (Kirmani and Rao 2000, Rao 2005) but is actually associated with higher prices (see Table 2)

If higher brand quality is associated with higher prices, unanticipated increases (decreases) in brand quality are likely to make the brand more (less) vulnerable to downturns This is because, during downturns, consumers become more price conscious (e g , Estelami, Lehmann, and Holden 2001) and are likely to cut down on the purchase quantities of high-quality brands Loyal customers also tend to be price sensitive when making purchase decisions during downturns (Krishnamurthi and Raj 1991) Indeed, a recent study finds that store brands (lower quality) tend to outperform national brands (higher quality) during recessions (Lamey et al 2007) In contrast, high-quality brands benefit from market upswings because consumers buoyed by the positive outlook are more likely to purchase them (e g , Ward et al 2002) This suggests that an unanticipated increase in brand quality is likely to make cash flows more vulnerable to stock market movements—that is, increase systematic risk Thus

$H_{2(alt)}$ Unanticipated changes in brand quality are positively associated with changes in systematic risk

Idiosyncratic Risk

Idiosyncratic risk is the volatility in stock returns that cannot be explained by the stock market movements and therefore represents investor's uncertainty related to future cash flows (Fu 2009) We argue that unanticipated increases (decreases) in brand quality are likely to lower the volatility of future cash flows and therefore decrease (increase) idiosyncratic risk

Because increases in brand quality increase customer loyalty, they are also likely to reduce a firm's vulnerability to competitive actions This is because loyal customers are less likely to switch brands as a result of price reduction or other competitor promotions (see Keller 1993, Klemperer 1995) High customer retention and low vulnerability to competitive actions, in turn, translate into lower volatility of cash flows as customers continue to purchase a firm's offerings

Increasing brand quality also allows a firm to expand its offerings because customers are more likely to respond positively to their brand extensions (e g , Echambadi et al 2006) Such brand extensions diversify the sources of cash flows as a firm receives revenues from newer offerings and relies less on existing product/service categories An increase in brand quality also allows a firm to license its brand across diverse categories For example, Disney Inc licenses its brand in categories as diverse as toys, movies, and apparel Therefore, brand licensing allows a firm with increasing brand quality to diversify its revenues with lower setup costs Accordingly,

H_3 Unanticipated changes in brand quality are negatively associated with changes in idiosyncratic risk

Moderating Role of Unanticipated Changes in Current-Period Earnings

Current-period earnings are viewed as the most important metric of the accounting system (Dichev and Tang 2008) and are widely followed by senior management (Graham, Harvey, and Rajgopal 2005) An unanticipated increase in current-period earnings is a signal that the future performance of a firm is likely to be better than current expectations (Dechow 1994) Consequently, in general, investors react positively to unanticipated increases in current-period earnings (e g , DellaVigna and Pollet 2009)

Payoffs from intangible assets such as brand quality are considered uncertain because their benefits generally accrue in the future (Financial Accounting Standards Board 2001, Securities and Economics Commission 2001) Therefore, if an unanticipated increase in brand quality is accompanied by an unanticipated increase in current-period earnings, it is a signal to investors that the firm is able to build brand quality without sacrificing its current and future performance Unanticipated increases in earnings also suggest that a firm is likely to invest in resources required to maintain and strengthen its brand quality (Bahadir, Bharadwaj, and Srivastava 2008) In contrast, an unanticipated increase in brand quality accompanied by an unanticipated decrease in current-period earnings is likely to indicate that the firm may not be able to invest in high-quality staff or equipment, which could be the source of brand's quality associations A strong quality brand without the resources to sustain and enhance quality faces the dilution of its existing advantage (Bharadwaj, Varadarajan, and Fahy 1993)

Therefore, investors are likely to have a more favorable evaluation of the unanticipated increases in brand quality if these are accompanied by unanticipated increases in current-period earnings Accordingly, the effects of unanticipated changes in brand quality on stock returns and changes in idiosyncratic risk are likely to be stronger in the presence of unanticipated increases in current-period earnings In addition, if unanticipated changes in brand quality have a negative impact on changes in systematic risk (the loyalty argument), these effects will be stronger in the presence of unanticipated increases in current-period earnings However, if unanticipated changes in brand quality have a positive effect on changes in systematic risk (the price premium argument), owing to investors' favorable evaluation, such effects will be weaker in the presence of unanticipated increases in current-period earnings Formally,

H_4 The effect of unanticipated changes in brand quality on stock returns is more (less) positive when there is an unanticipated increase (decrease) in current-period earnings

H_5 The effect of unanticipated changes in brand quality on changes in systematic risk is more (less) negative when there is an unanticipated increase (decrease) in current-period earnings

$H_{5(alt)}$ The effect of unanticipated changes in brand quality on changes in systematic risk is less (more) positive when there is an unanticipated increase (decrease) in current-period earnings

H_6 The effect of unanticipated changes in brand quality on changes in idiosyncratic risk is more (less) negative when there is an unanticipated increase (decrease) in current-period earnings

Moderating Role of Unanticipated Changes in Industry Concentration

Research in finance frequently underscores the importance of industry concentration on investors' evaluation of a firm's stock price (e g , Gaspar and Massa 2006, Hou and Robinson 2006) Industry concentration is a key concept in industrial organization and competitive marketing strategy (Szymanski, Bharadwaj, and Varadarajan 1993, Tirole 1988) It indicates the degree of competition in an industry such that higher (lower) industry concentration indicates lower (higher) competition Therefore, an increase in industry concentration indicates high barriers to entry and low consumer choice (Giroud and Mueller 2011) Given the importance of competition and consumer choice to managers, scholars, and policy makers, it is important to determine whether investors differ in their evaluation of unanticipated changes in brand quality across unanticipated changes in industry concentration

As we noted previously, an unanticipated increase in brand quality raises the probability of customers choosing a brand and paying a higher price for it, thereby increasing future cash flows Investors are likely to appreciate unanticipated increases in brand quality more for firms in industries in which there is an unanticipated decrease in concentration This is because an unanticipated decrease in industry concentration indicates that firms are likely to face higher competition and, thus, greater difficulty in increasing cash flows Indeed, as industry concentration decreases, the pressure increases on managers to raise productivity and to innovate and differentiate their offerings to attract and retain customers (e g , Hou and Robinson 2006) In contrast, an unanticipated increase in industry concentration indicates that customers have fewer choices, and there is lower pressure on firms to differentiate their offerings As a result, the value of an unanticipated increase in brand quality for an investor is likely to be lower, compared with when there is an unanticipated decrease in industry concentration Thus

H_7 The effect of unanticipated changes in brand quality on stock returns is less (more) positive when there is an unanticipated increase (decrease) in industry concentration

H_8 The effect of unanticipated changes in brand quality on changes in systematic risk is less (more) negative when there is an unanticipated increase (decrease) in industry concentration

$H_{8(alt)}$ The effect of unanticipated changes in brand quality on changes in systematic risk is more (less) positive when there is an unanticipated increase (decrease) in industry concentration

H_9 The effect of unanticipated changes in brand quality on changes in idiosyncratic risk is less (more) negative when there is an unanticipated increase (decrease) in industry concentration

Methodology

Models and Estimation Procedure

Stock response model We use a stock response model to assess the impact of unanticipated changes in brand quality on stock returns This is in line with the following underlying principle

> Because share returns reflect aggregate investor use of information, tests of association between performance metrics and returns shed light on the extent to which a given metric is a relatively good, or relatively poor, summary indicator of the information actually used by investors (Francis, Schipper, and Vincent 2003, p 126)

Following Srinivasan and Hanssens (2009), we begin with the benchmark three-factor model (see Fama and French 1993)

$$(1)\quad (R_{ijT} - R_{fT}) = \alpha + \beta(R_{mT} - R_{fT}) + s(SMB_T) + h(HML_T) + \varepsilon_{SijT},$$

where

R_{ijT} = compounded monthly stock returns of firm i in industry j for the year T,
R_{fT} = risk-free rate of returns for the year T calculated using U S Treasury bonds,
R_{mT} = stock market returns for the year T,
SMB_T = Fama and French (1993) size portfolio returns for the year T,
HML_T = Fama and French (1993) book-to-market value portfolio returns for the year T, and
$\varepsilon_{SijT} = a_i + a_j + v_{SijT}$, and $v_{SijT} \sim N(0, \sigma_S)$

Equation 1 is augmented with the unanticipated changes in accounting and marketing variables

$$(2)\quad (R_{ijT} - R_{fT}) = \alpha + \beta(R_{mT} - R_{fT}) + s(SMB_T) + h(HML_T) + \gamma_{s1}(U\Delta BQ_{ijT}) + \gamma_{s2}(U\Delta EAR_{ijT}) + \gamma_{s3}(U\Delta IC_{jT}) + \gamma_{s4}(U\Delta TS_{ijT}) + \varepsilon_{SijT},$$

where

$U\Delta(BQ)_{ijT}$ = unanticipated changes in brand quality of firm i in industry j during year T,
$U\Delta(EAR)_{ijT}$ = unanticipated changes in current-period earnings,
$U\Delta(IC)_{jT}$ = unanticipated changes in industry concentration, and
$U\Delta(TS)_{ijT}$ = unanticipated changes in total sales

The significance of γ_{s1} in Equation 2 indicates whether unanticipated changes in brand quality provide information incremental to that provided by the Fama and French (1993) factors and the accounting variables The full model that tests the main effect and moderator hypotheses is as follows

$$(3)\quad (R_{ijT} - R_{fT}) = \alpha + \beta(R_{mT} - R_{fT}) + s(SMB_T) + h(HML_T) + \gamma_{s1}(U\Delta BQ_{ijT}) + \gamma_{s2}(U\Delta EAR_{ijT}) + \gamma_{s3}(U\Delta IC_{jT}) + \gamma_{s4}(U\Delta TS_{ijT}) + \gamma_{s5}(U\Delta BQ_{ijT} \times U\Delta EAR_{ijT}) + \gamma_{s6}(U\Delta BQ_{ijT} \times U\Delta IC_{jT}) + \varepsilon_{SijT}$$

Risk models We use models that include changes in systematic and idiosyncratic risk as the dependent variables and unanticipated changes in marketing and accounting metrics as the independent variables Because changes in a variable incorporate both current and lagged values, the use of changes in risk as dependent variables enables us to take into account the inertia in risk metrics (e g , Lui, Markov, and Tamayo 2007) Importantly, these models approximate a first-differences model and are therefore consistent with recent recommendations that research in marketing should *not* use levels models in the context of stock returns and related measures (see Mizik and Jacobson 2009, pp 321–22, Srinivasan and Hanssens 2009, p 300) Specifically,

$$(4)\quad \Delta\beta_{ijT} = \delta + \gamma_{b1}(U\Delta BQ_{ijT}) + \gamma_{b2}(U\Delta BQ_{ijT} \times U\Delta EAR_{ijT}) + \gamma_{b3}(U\Delta BQ_{ijT} \times U\Delta IC_{jT}) + \gamma_{b4}(U\Delta EAR_{ijT}) + \gamma_{b5}(U\Delta IC_{jT}) + \gamma_{b6}(U\Delta TA_{ijT}) + \gamma_{b7}(U\Delta TS_{ijT}) + \gamma_{b8}(U\Delta DIV_{ijT}) + \gamma_{b9}(U\Delta LV_{ijT}) + \varepsilon_{\beta ijT}, \text{ and}$$

$$(5)\quad \Delta IR_{ijT} = \omega + \gamma_{r1}(U\Delta BQ_{ijT}) + \gamma_{r2}(U\Delta BQ_{ijT} \times U\Delta EAR_{ijT}) + \gamma_{r3}(U\Delta BQ_{ijT} \times U\Delta IC_{jT}) + \gamma_{r4}(U\Delta EAR_{ijT}) + \gamma_{r5}(U\Delta IC_{jT}) + \gamma_{r6}(U\Delta TA_{ijT}) + \gamma_{r7}(U\Delta TS_{ijT}) + \gamma_{r8}(U\Delta DIV_{ijT}) + \gamma_{r9}(U\Delta LV_{ijT}) + \varepsilon_{RijT},$$

where

$\Delta\beta_{ijT} = \beta_{ijT} - \beta_{ij(T-1)}$, the change in systematic risk of firm i in industry j in year T,
$\Delta IR_{ijT} = IR_{ijT} - IR_{ij(T-1)}$, the change in idiosyncratic risk,
$U\Delta TA_{ijT}$ = unanticipated changes in total assets,
$U\Delta DIV_{ijT}$ = unanticipated changes in dividends paid,
$U\Delta LV_{ijT}$ = unanticipated changes in financial leverage,
$\varepsilon_{\beta ijT} = a_i + a_j + v_{\beta ijT}$, and $v_{\beta ijT} \sim N(0, \sigma_\beta)$, and
$\varepsilon_{RijT} = a_i + a_j + v_{RijT}$, and $v_{RijT} \sim N(0, \sigma_R)$

We follow Srinivasan et al (2009) and use a fixed-effects time-series panel model to estimate Equations 3–5 This model uses the within transformation to account for time-invariant unobservables (firm- and industry-specific fixed effects) that could be correlated with independent variables (see Wooldridge 2009, p 481) As such, this model addresses the potential endogeneity of independent variables that could arise from them being correlated with unobservables

Data Collection and Measures

We use four sources to collect data The brand quality metric comes from Harris Interactive's EquiTrend database, one of few sources of longitudinal data for brand quality that is widely used in academic research (e g , Aaker and Jacobson 1994, Clark, Doraszelski, and Draganska 2009, Mitra and Golder 2006, Mizik and Jacobson 2004, Rego, Billett, and Morgan 2009) Every year, Harris Interactive conducts an online survey of 20,000–43,000 consumers for approximately 1000 brands Each consumer is asked to rate a brand's perceived quality on a scale from 0 ("unacceptable/poor quality") to 10 ("outstanding/extraordinary quality"), with each brand being rated by at least 1000 consumers For each brand, the brand quality score is the weighted average of consumer responses The weights assigned are based on matching the sample's demographic composition to the demographic composition of the United States

Consistent with prior research, we include only firms that are publicly listed "monobrand" firms—that is, firms with a single, prominent brand (e g , Mizik and Jacobson 2008) This is important because the quality ratings are available at the brand level, whereas the stock returns and risk measures are at the firm level In addition, we include only firms that have at least two consecutive years of data so that we can calculate the unanticipated changes in brand quality

We obtained data for daily and monthly stock returns from the Center of Research on Stock Prices (CRSP) We obtained data for the value-weighted market portfolio, the Fama and French (1993) factors, Treasury bond rates, and the momentum factor from Dr Kenneth French (http //mba tuck dartmouth edu/pages/faculty/ken french/data_library html) For accounting measures, we use the Standard & Poor's COMPUSTAT quarterly data file

We align the quarterly COMPUSTAT data and the CRSP data to the brand quality data measured by Harris Interactive at the end of the first calendar quarter The stock returns were measured over the 12 months ending with March of the given year The quarterly accounting data were aligned with the 12 months starting with the start of April in the preceding year to the end of March in the given year For example, for the brand quality data released at the end of March 2001, the matching measure of stock returns was from the first trading day of April 2000 to the last trading date of March 2001 The accounting data were also aligned over the four quarters from fiscal quarter starting in or closest to April 2000 and ending in or closest to March 2001

Stock returns We use the compounded monthly returns over the 12-month period that corresponds to the time between the release of brand quality data by Harris Interactive (e g , Mizik and Jacobson 2008) We denote this 12-month period as year T

$$(6) \qquad R_{ijT} = \Pi^{l}_{m=k}(1 + ret_{ijm}),$$

where R_{ijT} is the stock return for firm i in industry j for the year T and ret_{ijm} is the holding period return for firm i in industry j during month m Here, l is the first month at the start of the year T, and k is the last month of the year T

Systematic and idiosyncratic risk We use the Fama and French (1993) three-factor model to obtain the measures of systematic and idiosyncratic risk We estimate Equation 7 for each firm i in industry j during the 252 trading days (t) corresponding to the year T for which the brand quality and accounting data are aligned and for which the stock returns are calculated In Equation 7, β_{ijT} represents the systematic risk for a firm i in industry j for year T, while the idiosyncratic risk is the standard deviation of residuals from this model

$$(7) \quad (R_{ijt} - R_{ft}) = \alpha_{ijT} + \beta_{ijT}(R_{mt} - R_{ft}) + s_{ijT}(SMB)_t + h_{ijT}(HML)_t + E_{ijt},$$

where

α_{ijT} = abnormal stock returns of firm i in industry j during year T,

R_{ijt} = daily return on stock of firm i in industry j on day t,

R_{ft} = daily risk free return on day t,

R_{mt} = daily return on a value-weighted market portfolio on day t,

$(SMB)_t$ = returns from the Fama and French (1993) size portfolio on day t,

$(HML)_t$ = returns from the Fama and French (1993) market-to-book portfolio on day t, and

E_{ijt} = Residuals ~ $N(0, \sigma_E)$

$$(8) \qquad R_{ijt} = [(D_{ijt} + P_{ijt}) - P_{ij(t-1)}]/P_{ij(t-1)}, \text{ and}$$

$$(9) \qquad R_{mt} = [L_t - L_{(t-1)}] / L_{(t-1)}],$$

where

D_{ijt} = dividends from firm i in industry j on day t,

P_{ijt} = split adjusted stock price of firm i in industry j on day t, and

L_t = market price adjusted index of a value-weighted market portfolio comprising all stocks on NASDAQ, AMEX, and NYSE markets on day t

Therefore, for each firm i in industry j for year T, we have the stock returns (R_{ijT}) and the corresponding values of the systematic (β_{ijT}) and idiosyncratic risk (IR_{ijT}) of stock returns

Current-period earnings and industry concentration We use operating income before depreciation (COMPUSTAT Data Item 21) scaled by total assets (Item 2) as a measure of current-period earnings (e g , Mizik and Jacobson 2008) Following prior research, we use the Herfindahl concentration index as a measure of industry concentration (e g , Hou and Robinson 2006) We use the Standard Industrial Classification (SIC) four-digit code as an indicator of an industry and measure industry concentration at this level

$$(10) \qquad IC_{jT} = \Sigma^{I}_{i=1} ms_{ijT}^2,$$

where ms_{ijT} is the market share of firm i in industry j at year T

Control variables Table 3 outlines the control variables, their definitions, expected effects, and the literature supporting their inclusion in the models To control for the expected stock returns, we use the excess stock market returns, size portfolio returns, and the book-to-market portfolio returns (see Srinivasan and Hanssens 2009) To account for marketing actions that could enhance sales, we control for a firm's sales growth

For the idiosyncratic and systematic risk models, we use total assets, total sales, Herfindahl concentration index, dividend payouts, and financial leverage as control variables The inclusion of dividend payouts and financial leverage follows from research in finance and accounting, which shows that these variables are likely to have an impact on the systematic and idiosyncratic risk of stock returns (see Table 3)

Unanticipated changes Following recent literature (e g , Mizik and Jacobson 2004, Srinivasan et al 2009), we use a first-order autoregressive model to form time-based expectations about the accounting and marketing metrics and use deviations from these expectations as a measure of the unanticipated changes in these metrics Specifically,

$$(11) \qquad Y_{ijT} = a_0 + \theta_1 Y_{ij(T-1)} + \eta_{ijT},$$

where θ_1 is the first-order autoregressive coefficient depicting the persistence of the series The unanticipated change in variable Y_{ijT} is the residual obtained from the estimation of Equation 11 We estimate Equation 11 for each variable using clustered standard errors (Mizik and Jacobson 2009)

Results

Combining the four data sets yields 519 observations from 132 firms (see Table 4) The panel data cover a period of six years from 2000 to 2005 and are unbalanced The observations come from six sectors computers and telecommunications (15%), retail and apparel (30 2%), financial services

TABLE 3
Definitions, Measures, and Literature Sources for Control Variables

Variable	Definition	Expected Impact	Specific Data Source	Examples of Prior Literature Support
Excess stock market returns	Compounded monthly returns from a value-weighted portfolio of all stocks listed on NASDAQ, AMEX, and NYSE, less the returns from investing in U S treasury bonds	Positive impact on excess stock returns	Kenneth French website	Fama and French (1993)
Size portfolio returns	Compounded monthly returns from the Fama and French (1993) size portfolio	Positive impact on excess stock returns	Kenneth French website	Fama and French (1993)
Market-to-book portfolio returns	Compounded monthly returns from the Fama and French (1993) market-to-book portfolio	Positive impact on excess stock returns	Kenneth French website	Fama and French (1993)
Total sales	The log of the total sales of a firm	Unanticipated changes in sales are likely to be positively related to stock returns and negatively related to changes in systematic and idiosyncratic risk	COMPUSTAT [Data Item 2]	Beaver, Kettler, and Scholes (1970)
Total assets	The logged value of total assets of a firm	Unanticipated changes in total assets are likely to be positively related to the changes in systematic risk and negatively related to changes in idiosyncratic risk	COMPUSTAT [Data Item 44]	Beaver, Kettler, and Scholes (1970)
Leverage ratio	The ratio of total long-term debt to the market capitalization of a firm	Unanticipated changes in leverage are likely to be positively related to changes in systematic and idiosyncratic risk	COMPUSTAT [Data Items 14, 51, 61]	Hong and Sarkar (2007)
Dividends payout	The ratio of cash dividends to the market capitalization of a firm	Unanticipated changes in dividends are likely to be negatively related to the changes in systematic and idiosyncratic risk	COMPUSTAT [Data Items 14, 61, 89]	McAlister, Srinivasan, and Kim (2007)
Competitive intensity	The SIC four-digit concentration index of firm revenues	Unanticipated changes in industry concentration are likely to be negative related to stock returns and changes in systematic and idiosyncratic risk	Herfindahl concentration index using COMPUSTAT [Data Item 2]	Hou and Robinson (2006)

TABLE 4
Descriptive Statistics

Variable	Symbol	Observations	M	SD	Correlation Matr					
					1	2	3	4	5	6
1 Stock Returns	R_{ijT}	519	11	53	1 00					
2 ΔSystematic Risk	$\Delta\beta_{ijT}$	519	04	46	–08	1 00				
3 ΔIdiosyncratic Risk	ΔIR_{ijT}	519	–29	71	–32	11	1 00			
4 UΔ(Brand Quality)	$U\Delta BQ_{ijT}$	519	01	19	11	09	–13	1 00		
5 UΔ(Earnings)	$U\Delta EAR_{ijT}$	519	00	04	13	–10	–12	04	1 00	
6 UΔ(Industry Concentration)	$U\Delta IC_{jT}$	519	00	04	03	–02	–07	–02	–02	1 00
7 UΔ(Total Sales)	$U\Delta TS_{ijT}$	519	00	19	12	–14	01	07	22	–04
8 UΔ(Total Assets)	$U\Delta TA_{ijT}$	519	00	17	15	02	–01	–03	–04	02
9 UΔ(Dividends)	$U\Delta DIV_{ijT}$	519	00	03	–13	–16	11	07	02	03
10 UΔ(Leverage)	$U\Delta LV_{ijT}$	510	00	08	–59	06	31	–12	–21	00

Notes UΔ = unanticipated changes in the variable All correlations 08 and above are significant at 95%

(14 45%), consumer durables (12 5%), consumer nondurables (21 2%), and travel and transport (6 55%) [3] Table 5 outlines the results of the models

Brand Quality and Stock Returns

Model fit diagnostics support the full model (including the moderating effects) over the main-effects-only model (likelihood ratio test $\chi^2(2) = 22\ 14, p < 01$) Importantly, the results in the full model support H_1, unanticipated changes in brand quality are positively associated with stock returns ($\gamma_{s1} = 48, p < 01$) In support of H_4, we find that the interaction of unanticipated changes in brand quality and current-period earnings has a positive effect on stock returns ($\gamma_{s5} = 8\ 18, p < 01$) In support of H_7, the interaction of unanticipated changes in brand quality and industry concentration has a negative effect on stock returns ($\gamma_{s6} = -13\ 65, p < 01$)

To illustrate the impact of these interactions, we calculate the marginal effects of unanticipated changes in brand quality on stock returns and plot it against unanticipated changes in current-period earnings and industry concentration Figure 1, Panel A, shows that the positive effect of unanticipated changes in brand quality on stock returns becomes stronger when there is an unanticipated increase in current-period earnings In contrast, the positive effects of unanticipated changes in brand quality on stock returns decrease when there is an unanticipated increase in industry concentration (see Figure 1, Panel B)

Parameter estimates for the control variables are in line with prior literature Consistent with Srinivasan et al (2009), we find that excess stock market portfolio returns have a positive impact on stock returns ($\beta = 97, p < 01$) The results of the Fama and French (1993) factors are also in line with expectations that smaller firms tend to do better than the stock market ($s = 65, p < 01$), and firms with higher book-to-market ratio do better than the stock market ($h = 41, p < 01$) Consistent with research in accounting (e g , Kothari 2001), unanticipated changes in earnings (1 13, $p < 05$) and sales (21, $p < 05$) have a positive impact on stock returns

Brand Quality and Systematic Risk

The results support the full model as compared to a main-effects-only model (likelihood ratio test $\chi^2(2) = 13\ 69, p < 01$) In line with the price-premium argument ($H_{2(\text{alt})}$), we find that unanticipated changes in brand quality are positively associated with changes in systematic risk ($\gamma_{b1} = 26$, $p < 05$) As Figure 1, Panel C shows, $H_{5(\text{alt})}$ is also supported, the impact of unanticipated changes in brand quality on changes in systematic risk is weaker (stronger) for unanticipated increases (decreases) in current-period earnings ($\gamma_{b2} = -8\ 76, p < 01$) H_8 is also supported (see Figure 1, Panel D), we find that the effect of unanticipated changes in

TABLE 5
Changes in Brand Quality Impact Stock Returns, Systematic and Idiosyncratic Risk*

	Main-Effects Model			Full Model		
	Stock Returns	Δ(Systematic Risk)	Δ(Idiosyncratic Risk)	Stock Returns	Δ(Systematic Risk)	Δ(Idiosyncratic Risk)
$U\Delta BQ_{ijT}$	47***	29**	− 43***	48***	26**	− 42**
$(U\Delta BQ_{ijT}) \times (U\Delta EAR_{ijT})$				8 18 ***	−8 76***	3 24
$(U\Delta BQ_{ijT}) \times (U\Delta IC_{jT})$				−13 65***	8 83**	19
Control Variables						
$(R_{mT} - R_{fT})$	96***			97***		
$(SMB)_T$	63**			65**		
$(HML)_T$	40***			41***		
$U\Delta EAR_{ijT}$	1 39***	− 90*	−1 98**	1 13**	− 72	−2 04***
$U\Delta IC_{jT}$	35	09	−1 35*	77*	− 17	−1 38*
$U\Delta TS_{ijT}$	18*	− 53***	27*	21**	− 56***	27*
$U\Delta TA_{ijT}$		23*	− 39*		24*	− 39*
$U\Delta DIV_{ijT}$		−2 45***	1 24		−2 08**	1 19
$U\Delta LV_{ijT}$		35	2 79***		23	2 81***
N	519	510	510	519	510	510
F-statistic	(7, 380) = 33 10***	(7, 371) = 5 20***	(9, 378) = 9 99***	(9, 369) = 28 55***	(7, 371) = 5 25***	(9, 369) = 7 78***
R^2	38	09	16	41	11	16
Max VIF	2 02	1 24	1 24	2 02	1 25	1 25

*$p <$ 10 (one-sided)
**$p <$ 05 (one-sided)
***$p <$ 01 (one-sided)
Notes Max VIF = maximum variance inflation factor

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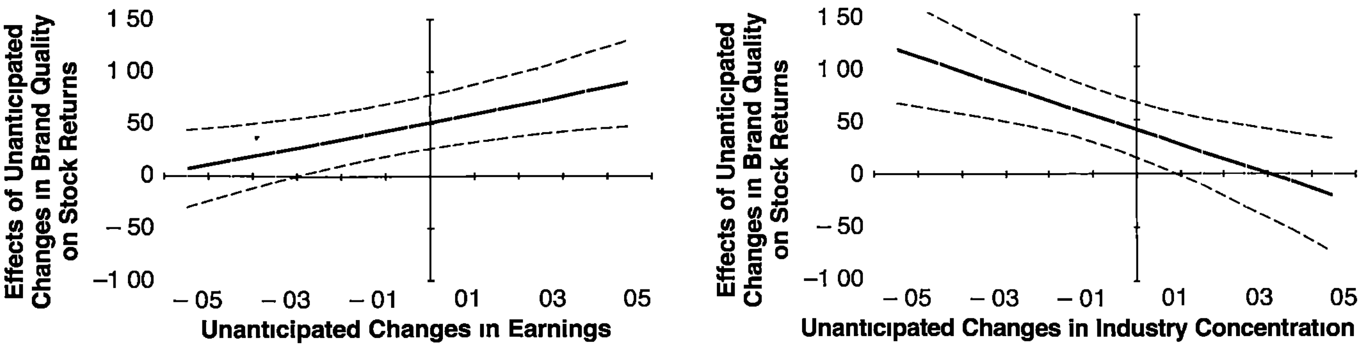
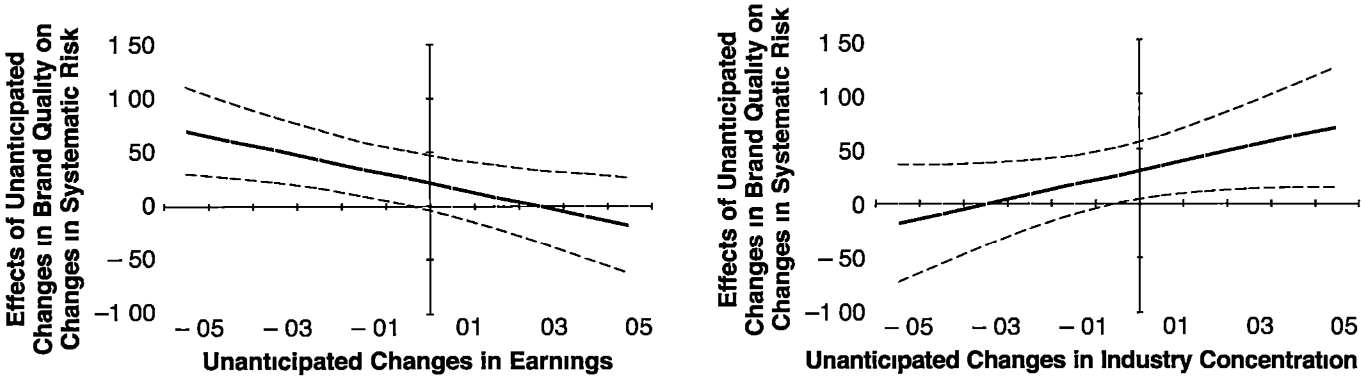
[3] Sectors comprise following SIC codes computer and telecommunications (3570, 3571, 3663, 3674, 4812, 4813, 7370, 7372, 7373), retail and apparel (2300, 2320, 2330, 5211, 5311, 5331, 5399, 5411, 5531, 5661, 5700, 5731, 5812, 5912, 5940, 5944, 5945, 5990), financial services (6020, 6035, 6111, 6141, 6199, 6211, 6282, 6311, 6324, 6331, 6798), consumer durables (3011, 3089, 3420, 3540, 3559, 3630, 3651, 3711, 3861, 3944), consumer nondurables (100, 2030, 2060, 2080, 2670, 2711, 2721, 2731, 2834, 2840, 2844, 2911, 3021, 4841, 7011, 7510, 7841), and travel and transport (4400, 4512)

FIGURE 1
The Moderating Impact of Unanticipated Changes in Earnings and Industry Concentration


A: Effects of Unanticipated Changes in Brand Quality on Stock Returns × Unanticipated Changes in Earnings

B: Effects of Unanticipated Changes in Brand Quality on Stock Returns × Unanticipated Changes in Industry Concentration


C: Effect of Unanticipated Changes in Brand Quality on Changes in Systematic Risk × Unanticipated Changes in Earnings

D. Effect of Unanticipated Changes in Brand Quality on Changes in Systematic Risk × Unanticipated Changes in Industry Concentration

Notes The dotted lines indicate the 95% confidence interval bands

brand quality on changes in systematic risk is stronger (weaker) for unanticipated increases (decreases) in industry concentration ($\gamma_{b3} = 8\ 83, p < 05$) We also find that unanticipated changes in sales have a negative effect ($- 56, p < 01$), in total assets have a positive effect ($24, p < 10$), and those in dividend payouts have a negative impact on the changes in systematic risk ($-2\ 08, p < 05$)

Brand Quality and Idiosyncratic Risk

Consistent with H_3, we find that unanticipated changes in brand quality are negatively related with changes in idiosyncratic risk ($\gamma_{r1} = - 42, p < 05$) We do not, however, find support for H_6 or H_9 The results for the control variables are largely in the expected direction Unexpected increases in earnings soothe investors' concerns and lower idiosyncratic risk ($-2\ 04, p < 01$) We also find that unanticipated changes in sales have a positive effect ($27, p < 10$), while those in total assets have a negative effect ($- 39, p < 10$) on changes in idiosyncratic risk Finally, unanticipated changes in industry concentration also decrease idiosyncratic risk ($-1\ 38, p < 10$)

Sensitivity Analyses

Alternative model We explicitly test the likelihood that the impact of unanticipated changes in brand quality on stock returns and changes in systematic and idiosyncratic risk could be mediated by the unanticipated changes in current-period earnings[4] We follow recent guidelines in the marketing literature (Zhao, Lynch, and Chen 2010) and examine the statistical significance of the indirect effect of unanticipated changes in brand quality (the mediated variable) on the outcomes (stock returns, systematic, and idiosyncratic risks) through the mediator (unanticipated changes in current-period earnings) using the Preacher and Hayes (2008) bootstrapping procedure In all three cases, the indirect effect is not significant, indicating that unanticipated changes in current-period earnings do not mediate brand quality's effect on the three outcome variables (the 95% bootstrap confidence interval for stock returns model was – 01 to 05, for systematic risk model, it was – 03 to 01, and for idiosyncratic risk model, it was – 06 to 31)

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[4] We sincerely thank an anonymous reviewer for suggesting this alternative model

Carhart model Studies in finance routinely use the Carhart (1997) model that includes a momentum factor to assess the robustness of their results to the use of Fama and French (1993) model The momentum factor is defined as the difference in the returns of firms with high and low prior stock performance (Carhart 1997) Specifically, the following model (rather than Model 3) can be used to test the stock returns hypotheses

$$
\begin{aligned}
(12)\quad (R_{ijT} - R_{fT}) = {} & \alpha + \beta(R_{mT} - R_{fT}) + s(SMB_T) + h(HML_T) \\
& + u(UMD)_T + \gamma_{s1}(U\Delta BQ_{ijT}) + \gamma_{s2}(U\Delta EAR_{ijT}) \\
& + \gamma_{s3}(U\Delta IC_{jT}) + \gamma_{s4}(U\Delta TS_{ijT}) + \gamma_{s5}(U\Delta BQ_{ijT} \\
& \times U\Delta EAR_{ijT}) + \gamma_{s6}(U\Delta BQ_{ijT} \times U\Delta IC_{jT}) + \varepsilon_{SijT},
\end{aligned}
$$

where $(UMD)_T$ are the returns from the momentum factor for year T and other symbols have usual meanings As we show in Table 6, our conclusions remain unchanged if we use this model

The Carhart (1997) model can also be estimated using daily returns to derive measures of systematic and idiosyncratic risk Specifically, rather than Equation 7, we used the following model to estimate systematic (β_{ijT}) and idiosyncratic risk (standard deviation of residuals)

$$
\begin{aligned}
(13)\quad (R_{ijt} - R_{ft}) = {} & \alpha_{ijT} + \beta_{ijT}(R_{mt} - R_{ft}) + s_{ijT}(SMB)_t + h_{ijT}(HML)_t \\
& + u_{ijT}(UMD)_t + E_{ijt}
\end{aligned}
$$

As we show in Table 6, our substantive conclusions do not change when we use this model

Endogeneity A potential concern with the models in this study is that brand quality is endogenous as firms with higher prior earnings, market capitalization, but lower prior systematic and idiosyncratic risk are more likely to have higher brand quality In addition, it can be argued that current-period earnings are a function of prior market capitalization, systematic and idiosyncratic risk, and brand quality Therefore, using three-stage least squares, we estimate a system of equations that takes into account the preceding arguments

$$
\begin{aligned}
(14)\quad (R_{ijT} - R_{fT}) = {} & \alpha + \beta(R_{mT} - R_{fT}) + s(SMB_T) + h(HML_T) \\
& + \gamma_{s1}(U\Delta BQ_{ijT}) + \gamma_{s2}(U\Delta EAR_{ijT}) + \gamma_{s3}(U\Delta IC_{jT}) \\
& + \gamma_{s4}(U\Delta TS_{ijT}) + \gamma_{s5}(U\Delta BQ_{ijT} \times U\Delta EAR_{ijT}) \\
& + \gamma_{s6}(U\Delta BQ_{ijT} \times U\Delta IC_{jT}) + \varepsilon_{SijT},
\end{aligned}
$$

$$
\begin{aligned}
\Delta\beta_{ijT} = {} & \delta + \gamma_{b1}[U\Delta BQ_{ijT}] + \gamma_{b2}[U\Delta BQ_{ijT} \times U\Delta EAR_{ijT}] \\
& + \gamma_{b3}(U\Delta BQ_{ijT} \times U\Delta IC_{jT}) + \gamma_{b4}[U\Delta EAR_{ijT}] \\
& + \gamma_{b5}[U\Delta TA_{ijT}] + \gamma_{b6}[U\Delta TS_{ijT}] + \gamma_{b7}[U\Delta DIV_{ijT}] \\
& + \gamma_{b8}[U\Delta LV_{ijT}] + \gamma_{b9}[U\Delta IC_{jT}] + \varepsilon_{\beta ijT},
\end{aligned}
$$

TABLE 6
Sensitivity Analyses Underscore the Robust Nature of Results

	Stock Returns	Δ(Systematic Risk)	Δ(Idiosyncratic Risk)
Using the Carhart Model			
$U\Delta BQ_{ijT}$	52***	21**	– 47***
$(U\Delta BQ_{ijT}) \times (U\Delta EAR_{ijT})$	8 15***	–7 20**	2 72
$(U\Delta BQ_{ijT}) \times (U\Delta IC_{jT})$	–13 49***	7 90**	– 42
N	519	510	510
F-statistic	(10, 377) = 25 76***	(9, 369) = 4 55***	(9, 369) = 8 57***
R^2	41	10	17
Using the Three-Stage Least Squares Model			
$U\Delta BQ_{ijT}$	47***	28***	– 25**
$(U\Delta BQ_{ijT}) \times (U\Delta EAR_{ijT})$	9 33***	–7 44***	3 15
$(U\Delta BQ_{ijT}) \times (U\Delta IC_{jT})$	–9 03**	7 89**	2 62
N	502	502	502
Chi-square (d f)	$\chi^2(9)$ = 285 75***	$\chi^2(9)$ = 65 95***	$\chi^2(9)$ = 91 33***
R^2	34	12	14
Using the Additional Controls			
$U\Delta BQ_{ijT}$	48***	25**	– 42**
$(U\Delta BQ_{ijT}) \times (U\Delta EAR_{ijT})$	8 28***	–9 53***	1 78
$(U\Delta BQ_{ijT}) \times (U\Delta IC_{jT})$	–13 45***	7 04*	16
N	511	502	502
F-statistic	(12, 368) = 22 15***	(12, 359) = 4 76***	(12, 359) = 7 10***
R^2	42	14	19
Removing ±5% Tile Outliers			
$U\Delta BQ_{ijT}$	22***	18**	– 24**
$(U\Delta BQ_{ijT}) \times (U\Delta EAR_{ijT})$	2 72**	–5 53**	1 98
$(U\Delta BQ_{ijT}) \times (U\Delta IC_{jT})$	–7 06***	12 04***	5 74
N	466	464	464
F-statistic	(9, 328) = 70 82***	(9, 325) = 9 52***	(9, 325) = 12 46***
R^2	66	21	26

*$p <$ 10 (one-sided)
**$p <$ 05 (one-sided)
***$p <$ 01 (one-sided)

$$\begin{aligned}\Delta IR_{ijT} = {} & \omega + \gamma_{r1}[U\Delta BQ_{ijT}] + \gamma_{r2}[U\Delta BQ_{ijT} \times U\Delta EAR_{ijT}] \\ & + \gamma_{r3}(U\Delta BQ_{ijT} \times U\Delta IC_{jT}) + \gamma_{r4}[U\Delta EAR_{ijT}] \\ & + \gamma_{r5}[U\Delta TA_{ijT}] + \gamma_{r6}[U\Delta TS_{ijT}] + \gamma_{r7}[U\Delta DIV_{ijT}] \\ & + \gamma_{r8}[U\Delta LV_{ijT}] + \gamma_{r9}[U\Delta IC_{jT}] + \varepsilon_{RijT},\end{aligned}$$

$$\begin{aligned}BQ_{ijT} = {} & \rho + \gamma_{bq1}[MCAP_{ij(T-1)}] + \gamma_{bq2}[\beta_{ij(T-1)}] \\ & + \gamma_{bq3}[IR_{ij(T-1)}] + \gamma_{bq4}[EAR_{ij(T-1)}] \\ & + \gamma_{bq5}[IC_{j(T-1)}] + \varepsilon_{BQijT}, \text{ and}\end{aligned}$$

$$\begin{aligned}EAR_{ijT} = {} & \sigma + \gamma_{e1}[MCAP_{ij(T-1)}] + \gamma_{e2}[\beta_{ij(T-1)}] \\ & + \gamma_{e3}[IR_{ij(T-1)}] + \gamma_{e4}[BQ_{ij(T-1)}] + \gamma_{e5}[IC_{j(T-1)}] \\ & + \varepsilon_{EARijT},\end{aligned}$$

where $MCAP_{ijT}$ = log of market capitalization of firm i in industry j at the end of year T and other symbols have the usual meanings. As we show in Table 6, our basic conclusions remain unchanged when the preceding model is used. We also find that earnings at (T – 1) have a positive impact (3.55, $p < .01$) and systematic risk at (T – 1) has a negative impact (–.14, $p < .05$) on brand quality. In addition, brand quality at (T – 1) has a positive effect on earnings at T (.05, $p < .01$). The results for other variables are also as we expected. Market capitalization has a positive impact (.01, $p < .05$), and systematic risk has a negative impact (–.04, $p < .01$) on earnings.[5]

Using additional controls. We also test for the impact of endogeneity by including three additional control variables—brand awareness, marketing spending, and R&D expenses—that are likely to have an impact on stock returns and risk (e.g., McAlister, Srinivasan, and Kim 2007; Mizik 2010). This follows the logic that unanticipated changes in brand quality could be correlated with unobservable factors and inclusion of additional control variables could test the robustness of results to the exclusion of such variables (see Mizik and Jacobson 2008, p. 29). We obtained data on brand awareness from Harris Interactive and data for marketing spending and R&D from COMPUSTAT. Following Mizik (2010), we subtract a firm's R&D expenses (COMPUSTAT Data Item 4) from its selling, general, and administrative expenses (Item 1) to obtain marketing spending. Both marketing spending and R&D expenses are scaled by total assets (see McAlister, Srinivasan, and Kim 2007). We calculate the unanticipated changes in these variables using Equation 11 and use them as additional controls in Equations 3–5. As we show in Table 6, our basic conclusions remain unchanged.

Removing outliers. We also assess the robustness of our results by removing the ±5 percentile residuals obtained from the estimation of the three Equations 3–5. As we show in Table 6, our basic conclusions do not change when such residuals are removed from the data set.

Discussion

The current study adds to the literature on the marketing–finance interface by examining the effects of unanticipated changes in brand quality on shareholder wealth and identifying two contingencies that moderate this relationship. However, a few limitations of the study must be acknowledged. The current study does not explicitly control for other brand-related metrics such as brand esteem and brand equity. These variables could have an impact on stock returns, be correlated with brand quality, and therefore lead to omitted variable bias. However, such a bias is unlikely to be a serious concern in the current context. Unanticipated changes in brand esteem do not have a significant effect on stock returns (Mizik and Jacobson 2008). Therefore, the lack of brand esteem as a control is unlikely to result in omitted variable bias. As we note in the sensitivity analyses, the use of additional controls also does not change our results. Finally, the use of a fixed-effects panel data model accounts for firm-specific unobservables and therefore is likely to mitigate omitted variable bias (see Wooldridge 2009).

Another potential limitation of the study is the short time frame of the data considered (2000–2005). While the length of the time frame is unlikely to bias our conclusions, future studies could use a long time series and examine whether the impact of unanticipated changes in brand quality on shareholder wealth varies across economic expansions and recessions. Finally, the analysis is based on brand quality measures collected from consumers in the United States, while many of the brands in the sample are sold globally.

Implications for Marketing Theory

The hypotheses and empirical results in the current study have several implications for the research in the marketing–finance interface. First, the study brings to fore the importance of examining both the risk and returns implications of marketing metrics. We find that while unanticipated changes in brand quality can enhance stock returns and lower idiosyncratic risk, they can also make a firm's stock returns more vulnerable to the stock market movements. This finding resonates with the recent anecdotal evidence that companies with higher quality were hurt more during the recent recession. For example, recently Procter & Gamble reported that it was "cutting prices and increasing promotions across nearly 10% of its household brands in a bid to raise volume sales and its market share. The company lost market share for key brands during the recession, as consumers traded down from its pricier offerings" (*Wall Street Journal Online* 2009).

Second, the current study advances a contingency theory of the marketing–finance interface. The results strongly support the argument that investors view unanticipated increases in brand quality less favorably if accompanied by decreases in current-period earnings because it is a signal that a firm does not have the resources to maintain and enhance its brand quality (see Figure 1, Panels A and C). Indeed, the financial press has begun to highlight well-known, high-quality brands (e.g., *Reader's Digest*, Blockbuster) that are likely to disappear due to the lack of resources to support them (24/7 Wall Street 2010)

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[5] We thank an anonymous reviewer for suggesting this alternative model.

We also find that unanticipated increases in brand quality become more valuable as competition increases (i e , unanticipated decreases in industry concentration, see Figure 1, Panels B and D) This result adds to the emerging empirical literature on the resource-based view in marketing that identifies other marketing metrics (e g , relationship multiplexity) that are more valuable in competitive environments (e g , Tuli, Bharadwaj, and Kohli 2010) Further research, therefore, should not only examine the main effects of marketing metrics on stock returns and risk but also consider the moderating effects of both firm- and industry-level factors

Third, results of this study underscore the differences in the impact of individual marketing assets and instruments on shareholder wealth While unanticipated changes in brand quality have a positive impact on changes in systematic risk, advertising (McAlister, Srinivasan, and Kim 2007) and brand equity (Rego, Billet, and Morgan 2009) lower systematic risk

McAlister, Srinivasan, and Kim (2007) argue that advertising enhances brand equity, which in turn lowers systematic risk The opposite conclusion in this study could be a result of the difference between the impact of advertising on brand equity and brand quality Brand quality is one dimension of brand equity, an aggregate construct with other dimensions such as awareness, purchase consideration, and distinctiveness (Rego, Billet, and Morgan 2009) The impact of advertising on brand equity, and therefore systematic risk, could be driven by its impact on other components of brand equity Indeed, a recent study found that advertising has a significant impact on brand awareness but not on brand quality (Clark, Doraszelski, and Draganska 2009)

Similarly, while the current study finds a significant impact of unanticipated changes in brand quality on stock returns, Mizik and Jacobson (2008) do not find a significant effect of unanticipated changes in brand esteem Brand esteem is also an aggregate construct that includes quality as one dimension (others being leadership, regard, and reliability) In summary, the differences between the results of this study and others that examine related constructs indicate that the effects of individual brand attributes on shareholder wealth are likely to differ Finally, the positive impact of unanticipated changes in brand quality on stock returns in this study combined with results of prior studies (see Table 1) suggests that the value relevance of brand quality could be viewed as an empirical generalization

Implications for Managers

Disclosure of brand quality The significant effects of unanticipated changes in brand quality on stock returns and changes in risk metrics support the practice of firms discussing brand quality with investors However, as Figure 1 shows, investors are likely to be less responsive to unanticipated changes in brand quality in the presence of unanticipated decreases in current-period earnings or for firms facing unanticipated increases in industry concentration Managers facing such conditions, therefore, need to be cognizant of the impact of these factors

This also suggests that managers need to explore options in framing their disclosure of brand quality information in a manner that is likely to make the investors appreciate brand quality even in the presence of unanticipated decreases (increases) in current-period earnings (industry concentration) For example, in disclosing brand quality under such circumstances, managers could articulate its long-term benefits (e g , higher loyalty, lower price sensitivity) to convince investors of the importance of brand quality This is a preliminary conjecture, and further research could be directed at examining how alternative ways of framing the disclosure of marketing metrics could elicit better responses from investors under conditions such as unanticipated decreases in earnings

Reporting brand quality The significant impact of unanticipated changes in brand quality on shareholder wealth also implies that perhaps brand quality should be measured and disclosed regularly in firms' annual Securities and Exchange Commission (SEC) filings (Wiesel, Skiera, and Villanueva 2008) However, the statistical significance of a metric is only a starting point in the discussion for inclusion in SEC filings Other criteria such as a cost–benefit analysis, reliability, and comparability also need to be evaluated (see Lambert 1998) Because the disclosures of such intangible assets are usually discretionary and are not standardized by generally accepted accounting principles, they impede a clear understanding of their value to investors Therefore, marketers need to develop industry-wide standards to measure marketing metrics and encourage adoption by the financial community The emerging initiative of the Marketing Standards and Accounting Board seems to be a step in that direction

Risk implications The impact of unanticipated changes in brand quality on changes in risk alerts senior managers to its risk implications On the positive side, the negative impact on changes in idiosyncratic risk is general and not conditional on the two moderators examined This result is important because idiosyncratic risk is a key metric that managers, financial analysts, and investors follow (Goyal and Santa-Clara 2003) Indeed, high idiosyncratic risk can put the survival of a firm at risk, hamper efforts to acquire or divest firm stock, and affect the value of stock options (e g , Clayton, Hartzell, and Rosenberg 2005)

However, the positive impact of unanticipated changes in brand quality on changes in systematic risk suggests that senior management needs to be aware of the risk–return trade-offs An increase in systematic risk implies that the stock returns expected by investors also increase because systematic risk is a key determinant of returns expected by investors and analysts (Brealey, Myers, and Allen 2008)[6] Consider a case in which the annual risk-free rate of return is 1% and stock market return is 5% The expected returns from firm with systematic risk of 1 will be 5% We find that a unit increase in brand quality results in an increase of .26 units in systematic risk. Therefore, the returns expected by investors for a firm whose systematic risk increases from 1 to 1.26 would increase from 5% to 6.04%, an increase of almost 21%. Similarly, systematic risk increases the cost of capital and is used by 80% of financial managers in their calculations for the same (Graham and Harvey 2001). Therefore, senior managers need to be alert to these secondary effects of changes in brand quality on investor expectations and cost of capital.

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[6] According to Brealey, Myers, and Allen (2008, p 214), Expected Returns = Risk-Free Rate of Return + Systematic Risk × (Market Return – Risk-Free Rate of Return)

In summary, the challenge for managers is to harvest the benefits of brand quality without increasing systematic risk. The results suggest that the deleterious impact of unanticipated changes in brand quality on changes in systematic risk is mitigated in the presence of unanticipated increases in current-period earnings. Consequently, managers need to adopt a joint focus on building brand quality and ensuring that current-period earnings are not compromised.

Employee evaluation. Firms frequently use brand quality–related measures for performance evaluation because it is a forward-looking concept (e.g., Campbell 2008; Luft 2009). The results of the moderator analyses suggest that in using brand quality as an employee evaluation tool, senior managers need to ensure that employees do not abuse incentive mechanisms by sacrificing current-period earnings to augment brand quality. Indeed, recent research suggests that employees tend to adopt short-term initiatives (e.g., discounts) to enhance their performance in terms of nonfinancial measures (see Marginson et al. 2010).

In addition, managers in firms faced with unanticipated increases in industry concentration cannot afford to be complacent about brand quality improvements, because the impact on systematic risk can be magnified in such conditions. Conversely, the finding that improvements in brand quality are more valuable in more competitive markets bodes well for marketing managers in that it demonstrates the value of marketing investments in brand quality to senior management. Indeed, research suggests that firms in more competitive industries are more likely to use nonfinancial performance measures (Banker and Mashruwala 2007).

Conclusion

The impact of brand quality on shareholder wealth is of relevance to managers, investors, and marketing research. The hypotheses and results in this study elaborate on several issues of managerial importance and bring to the fore issues that need scholarly investigation. We hope that this study provides an impetus for further research on this important topic.

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Jeffrey Loewenstein, Rajagopal Raghunathan, & Chip Heath

The Repetition-Break Plot Structure Makes Effective Television Advertisements

The plot structure in television advertisements can enhance consumers' brand attitudes and foster increasing consumer and industry recognition. A corpus analysis of contemporary television advertisements shows that advertisements using the repetition-break plot structure are a small percentage of television advertisements but a large percentage of Clio and Effie award–winning advertisements. They are also likely to attain postings and views on YouTube. Three experiments using television advertisements from contemporary brands show that repetition-break advertisements are persuasive, leading to more favorable brand attitudes and greater purchase intentions than similar plot structures and that this effect is attributable in part to the advertisements being more engaging. Thus, a theoretically explainable and generic plot structure yields effective advertisements. The result is a new and flexible tool for marketing professionals to use to generate advertisements, with guidelines for when and why it should and should not be effective.

Keywords: repetition-break, advertising, narratives, ad structure, surprise, engagement

Advertisers seek to increase consumer engagement with brands (Allen, Fournier, and Miller 2008, Polyorat, Alden, and Kim 2009). However, consumers vary in what they find engaging and, as such, enhancing consumer engagement has been a challenge (Homberg, Steiner, and Totzek 2009, Rumbo 2002, Yankelovich and Meer 2006). One means of addressing this challenge is to tell better and more universal stories to draw consumers in—that is, to develop engaging advertising by spurring thinking and transporting consumers in narratives (Adaval and Wyer 1998, Wang and Calder 2009, Wentzel, Tomczak, and Herrmann 2010). We report novel evidence that an old narrative structure found in folktales around the world (e.g., the Three Billy Goats Gruff, Barbeau 1960, Chophel 1984, Zipes 2002), called the repetition-break plot structure (Loewenstein and Heath 2009), is surprisingly potent in modern advertisements. In doing so, we contribute to marketing research showing that broadly valued and exceptionally creative communications can be generated through predictable underlying recipes for structuring advertising content. In support of this possibility, some existing effective advertisements use the repetition-break plot structure, so called because it uses a repetitious series of similar events to establish a pattern that is then extended or broken by a final event to generate new meaning (Loewenstein and Heath 2009). The similarity of the initial events spurs people to compare them and thereby generate a novel expectation, which sets up an opportunity for the final event to deviate and generate surprise. For example, one of the most successful advertising campaigns of the past 20 years is MasterCard's "Priceless" campaign. The first advertisement ran during the 1997 World Series. "Two tickets: $28. Two hot dogs, two popcorns, two sodas: $18. One autographed baseball: $45. Real conversation with 11-year-old son: priceless." It was a surprising and poignant advertisement, spurring MasterCard, previously a distant second in the credit card market to Visa, to parity in growth and spawning a campaign that translated easily into more than 100 countries.

The 2010 Grand Clio award for the best television advertisement also used the repetition-break plot structure. In the advertisement, Tasmanian water is said to be magic. It shows a series of parallel, dramatic transformations. A bicycle enters the water and turns into a motorcycle, a humble ukulele enters the water and turns into a beautiful guitar, an old kayak turns into a new speedboat, and, in the final key transformation, ordinary beer turns into Boag's Draught, the beer that is the subject of the advertisement. The previous campaign for Boag's Draught suggested it was a humbler product, showing construction workers laying pipe to deliver freshly brewed beer. Thus, the initial repetition of transformations established a pattern that was then extended, surprisingly, to the final item. Boag's Draught beer must be special. The new campaign spurred double-digit growth.

We suggest that the repetition-break plot structure, exemplified by the MasterCard and Boag's Draught adver-

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tisements, provides a general recipe for generating surprising and engaging narratives By articulating the critical elements of the repetition-break plot structure and documenting empirical evidence in support of its effectiveness, we add to the body of marketing research collecting and organizing ways to structure the content in advertisements, such as by using templates (Goldenberg, Mazursky, and Solomon 1999), rhetorical devices (McQuarrie and Mick 1996), and visual compositions (Pieters, Wedel, and Batra 2010) We contribute to work on ad structures by examining whether a plot structure, or a specific pattern for structuring events in a narrative, can be an effective tool for enhancing consumer engagement with advertisements Prior research on plot structure has largely focused on plot structure advantages for comprehension and recall (e g , Bartlett 1932, Thorndyke 1977) rather than engagement and has typically examined structure generated by causal and temporal relations (e g , event A led to event B) rather than structure generated by event similarity (e g , event A, event A′, event A″, event B) We also contribute to work on narratives in advertising (e g , Stern 1994) by examining particular narrative plot structures and, in particular, the repetition-break plot structure, which integrates elements of classical linear narratives and vignette narratives Finally, we contribute by providing not only a relatively simple and easy-to-implement recipe but also an explanation and tests of the processing account for when and why the recipe should (and should not) be effective Accordingly, in what follows, we ask and test whether repetition-break advertisements leverage surprise to engage consumers and increase their involvement with brands We provide a theoretical explanation for why the plot structure is an effective recipe, examine the scope of its potential, and document its effectiveness The result is evidence that the repetition-break plot structure is an underused, flexible, and valuable tool for marketers

Comparison-Generated Surprise

In the face of complaints that the audience is increasingly fragmented and disconnected, previous observations about the role of surprise in narratives have come up short because they provide no general guidance about how to engage a nonhomogeneous audience that may not share underlying expectations Central to prior discussions of why particular advertisements are engaging is that they surprise viewers by deviating from viewers' expectations (Lee 2000, Peracchio and Tybout 1996), leading them to resolve the incongruity (Speck 1991) The combination of surprise and resolution is the primary explanation for why humorous advertisements are engaging (Alden, Hoyer, and Lee 1993, Woltman Elpers, Mukherjee, and Hoyer 2004) and why creative advertisements are engaging (Yang and Smith 2009) Critically, surprise is also a key factor in why ad structures—such as rhetorical figures (McQuarrie and Mick 1996, 2003) and templates (Goldenberg, Mazursky, and Solomon 1999)—are effective The advertisement structures provide recipes for how to deviate from consumers' prior expectations to surprise and engage them A general consistency, then, in prior discussions of humor, creativity, and advertisement structures is the assumption that viewers come to the advertisement with the expectation that it will disrupt Repetition-break advertisements differ in that they first teach the expectation that they later disrupt The repetition-break plot structure creates surprises endogenously

Creating surprise by teaching expectations that are then disrupted is powerful because it allows advertisements to be engaging in novel ways and to a broad array of viewers Marketers have the challenge of appealing to an increasingly diverse and fragmented array of consumers With the repetition-break plot structure, marketers do not need to rely on just those consumers who already have the right expectation or depend on consumers having consistent expectations For example, McQuarrie and Mick (1999) find that some advertisement structures failed to be effective for foreign consumers and argue that the structures failed because these consumers did not have the requisite background expectations Because repetition-break advertisements teach expectations, they can avoid this problem Repetition-break advertisements can create surprises with novel expectations, such as by constructing a narrative logic relying on magic Tasmanian water, a fiction that could not be commonly known or expected among consumers Because the repetition-break plot structure both generates an expectation endogenously and then violates it to generate surprise, it provides a complete recipe for generating consumer engagement

Our explanation for why the repetition-break plot structure is effective rests on psychological research on comparison and surprise (Markman and Loewenstein 2010) The repetition-break plot structure leads people to draw comparisons by relying on surface similarity and close temporal succession of the initially repeated events, which encourage people to compare the events (Loewenstein and Gentner 2001) When people draw comparisons, it encourages them to attend to commonalities and prompts them to form generalizations (Gentner and Markman 1997) As a result of these psychological tendencies, the initial repetition phase of the repetition-break plot structure leads people to compare events and form an expectation about how subsequent events should unfold The expectation could be familiar or novel to viewers Critically, however, all viewers should have the information from comparing the initial repeated events to form the expectation, and viewers drawing comparisons to form the expectation is the first reason people find repetition-break advertisements engaging

The expectation derived from comparing the initial events sets up the possibility for a final event in the repetition-break plot structure to deviate from the pattern and generate surprise Deviating from the pattern spurs cognitive efforts to resolve the incongruity and make sense of the final event and the larger meaning of the narrative This should generate further engagement with the advertisement and brand Generating surprise is important because it heightens affective responses (Mellers 2000) Thus, repetition-break advertisements should influence consumers' cognition and affect, key drivers of ad effectiveness (Vakratsas and Ambler 1999) Repetition-break advertisements should also be involving because they engage viewers by leading them to form an expectation, experience a disruption and thus surprise, and then resolve the expectation with a heightened level of affect.

Repetition-break advertisements can surprise and engage viewers for a variety of purposes. Because the repetition-break plot structure should invoke surprise and incongruity resolution, it is a means for generating humor (Speck 1991). It overlaps with what in comedy is called the "law of threes," whose typical form is "setup, setup, punch line." However, our explanation and empirical evidence suggest the law of threes is a bit of a misnomer because a repetition-break plot can use any number of repetitions to set up the initial schema before the break. For example, the "Priceless" campaign typically uses a "law of fours" structure, with three repetitions before a break, and it sometimes uses as many as 20 initial repetitions.

More important, the repetition-break plot structure is not just a recipe for humor. Repetition-break advertisements can be engaging without being funny. Some of the "Priceless" advertisements, for example, are funny, but many others are touching, like the first one shown during the World Series. A Peruvian Cancer Foundation advertisement, a 2005 Clio gold medal winner, provides a powerful example of a non-humorous repetition-break advertisement. It shows a street magician repeatedly performing tricks and collecting money. The break in the sequence comes when his final trick is to regrow the hair on a child bald from cancer treatments—the implication being that giving money to physician–magicians for cancer research enables seemingly magical cures for sick children. (The advertisement made our research assistants cry.) If there is a common result of engaging consumers with repetition-break advertisements, we suggest it is to increase consumers' interest in and affective responses toward products and brands.

Overview of the Studies

This article makes a contribution to the literature by showing when and why repetition-break advertisements are effective. There is initial support for the repetition-break structure contributing to jokes, folktales, and music being liked and being socially selected (Loewenstein and Heath 2009; Rozin et al. 2006). These studies provide initial data showing that the repetition-break plot structure contributes to people's evaluations of the narrative itself. We extend these findings by showing that the plot structure is persuasive. Not only do we show that advertisements with repetition-break plot structures themselves are evaluated positively, we go on to show the important next step, namely, that engagement with the advertisements also creates positive attitudes about brands.

The studies make several additional contributions. Demonstrating repetition-break effects in the domain of television advertising is consequential. Tests of real-world advertising effectiveness show that substantial variance is due to the quality of the advertisements themselves. Advertising expenditures only extend the effectiveness of good advertisements; they do not improve the effectiveness of weak advertisements (Hu, Lodish, and Krieger 2007). The implication is that repetition-break advertisements are important to examine because they could provide a concrete and flexible tool for structuring effective advertisements, provided they have more backing than a few anecdotal successes. We provide evidence that the repetition-break plot structure yields advantages both for social selectivity in the form of YouTube postings and for industry selectivity in the form of major industry awards.

Finally, the current studies provide tests of the psychological processing account for why the repetition-break plot structure is effective. An advantage of the repetition-break plot structure, compared with some other proposed advertisement structures, is that we provided an analysis of the underlying psychological processing for its success. This led us to test, for example, whether comparison is critical to the plot structure's success. We examined whether repetition-break advertisements are engaging by both observing self-report measures and testing whether repetition-break advertisements stand out from the clutter of being exposed within sequences of multiple advertisements. We examine different kinds of outcomes to show the scope of the repetition-break plot structure's effectiveness and find that it is not particularly effective for generating baseline brand awareness but is specifically important for spurring brand involvement. The result is a substantial extension of the evidence supporting the understanding of when and why the repetition-break plot structure works.

Study 1

We have argued that the repetition-break plot structure should generate surprise and interest in broad audiences because it generates the expectation it relies on to generate surprise. In this study, we show that industry judges disproportionately select repetition-break advertisements for being creative and effective. We also show that consumers select repetition-break advertisements, posting and viewing them on YouTube with greater frequency than other types of advertisements.

To examine these possibilities, we examined cross-sections of advertisements at three levels of industry selectivity: low selectivity in the form of advertisements recorded straight from television, moderate selectivity in the form of advertisements included in an industry database, and high selectivity in the form of advertisements winning gold medal industry awards. We predicted that as the level of selectivity increases, the proportion of television advertisements using the repetition-break plot structure would increase.

We also examined consumers' selectivity by tracking the number of times consumers posted and viewed advertisements on YouTube. We predicted that repetition-break advertisements should promote posting and viewership.

To provide points of comparison, we also tracked advertisements using two related plot structures: repetition and contrast. We defined the two related structures according to their likeness to the repetition-break plot structure and suggestive findings in the literature. For our purposes, a television advertisement with a repetition plot structure consists of a series of similar events, similar to the beginning of a repetition-break plot structure. It differs in that it does not have a break. For example, an advertisement might consist of a series of events, each showing a consumer happily using a product, as is common in vignette advertisements (Stern 1994) Note that our definition of "repetition" pertains to the repetition of events in an advertisement, in contrast to most prior discussions of repetition in advertising, in which it is defined as seeing a given advertisement multiple times (e g , Campbell and Keller 2003) Closer to our use is prior work on repetition in narratives, which has emphasized the importance of repetition of events as well as repeated words and phrases for making narratives memorable (Rubin 1995) Repetition in the form of repeated use of a word or image has also proved to be effective as a rhetorical structure in advertisements (e g , McQuarrie and Mick 1996) Thus, if repeated events function similar to other uses of repetition, the repetition plot structure should help make advertisements memorable Still, because a repetition plot structure does not have a break to generate surprise, we suggest it should be less likely than the repetition-break plot structure to generate engaging, effective advertisements

The second alternative plot structure we considered is the contrast plot structure In our use, advertisements with a contrast plot structure consist of showing two related but differing events For example, an advertisement might show an event before buying the product and an event after buying the product or an event by a nonuser of the product followed by an event by a user of the product The contrast plot structure is similar to the repetition-break structure in that there is a break or shift between events, but there is just one initial event rather than several At least some forms of contrast have been shown to be effective (Goldenberg, Mazursky, and Solomon 1999), and resolving contrasts has been argued to be critical for generating humorous advertisements (Alden, Hoyer, and Lee 1993) However, the contrast plot structure lacks the initial comparison, which should make it less engaging than the repetition-break plot structure Furthermore, if advertisements need to be easily interpretable (as, e g , Woltman Elpers, Mukherjee, and Hoyer 2004 argue), this could limit advertisers to drawing contrasts along easy-to-identify dimensions, such as bad–good, old–new, and boring–exciting Alternatively, some consumers could fail to grasp more novel contrasts Either way, advertisements using contrast plot structures are at risk of failing to surprise and engage consumers

The repetition and contrast plot structures are similar to the repetition-break plot structure and draw on some of the same mechanisms, which makes them useful bases for comparison Still, because the repetition plot structure does not generate a change and the contrast plot structure cannot as readily establish a new expectation or ensure that consumers will form the same expectation, we predict that these plot structures should not confer as much of an advantage for industry and consumer accolades as the repetition-break plot structure

Methods

Materials We generated corpora including a total of 957 television advertisements representing three levels of industry selectivity As a proxy for a low level of social selectivity, we recorded advertisements shown during daytime and prime-time television shows We recorded four one-hour segments of television from four networks (ABC, CBS, NBC, and FOX) We recorded segments between the hours of 9 30 A M and 7 P M for the daytime sample and 7 P M –10 P M for the prime-time sample, randomly sampling time slots over two three-day periods We coded every unique advertisement shown over those 16 hours for consistency with the other samples, which did not include multiple instances of the same advertisement, though the statistical results are unchanged if we include the full sample We found that 9% of the daytime sample and 25% of the prime-time sample appeared more than once, yielding 232 unique daytime and 253 unique prime-time advertisements

As a proxy for a moderate level of industry selectivity, we sampled advertisements from a selective online database, Adforum com's Creative Library According to its website, Adforum's goal for the database is to provide the "best of advertising creativity worldwide," collected from an array of awards shows, agencies, and production companies We gathered 300 advertisements by drawing random samples from the Adforum com database from four national markets (United States, United Kingdom, Canada, and Australia) and four product categories (apparel, retail, consumer electronics, and beverages) As a marker of the selectivity of the advertisements in the Adforum com database, 29% of the advertisements in our sample had won some kind of industry award or honor

As a proxy for a high level of industry selectivity, we gathered advertisements winning gold medal Clio or Effie awards The Clio awards are one of the largest and most prestigious competitions in the advertising industry and, according to the Clio website, are given to "celebrate and reward creative excellence " Effie awards are granted specifically to reward effective advertising, and the largest component of the judges' scores is their evaluations of results—evidence that the advertising led to meeting and exceeding campaign objectives, such as for increasing sales, market share, and performance relative to competitors We selected advertisements winning awards in a product or service category, such as automotive, beverages, and consumer electronics We ignored advertisements winning Clio awards for animation, music, and the like We used the Adforum com database and the Clio website to collect 66 Clio and 106 North American and European Effie gold medal–winning television advertisements for a product category given from 2001 through 2009

Coding Two raters blind to the hypotheses of the study coded all the advertisements into one of four plot structure categories repetition-break, repetition, contrast, and other This coding was done solely by evaluating the events in the advertisements whether there were multiple events in the advertisement and, if so, if those events related to each other in the patterns specified by the repetition-break, repetition, or contrast plot structures The overall level of agreement was 86%, $\kappa = 72$ Coders resolved disagreements with discussion We present their consensus judgments, their original individual judgments yield the same qualitative pattern

YouTube searches. To generate measures of consumer recognition of advertisements, we generated YouTube searches for every repetition-break, repetition, and contrast advertisement from the Adforum.com sample (moderate selectivity). Thus, we were not looking at the proportion of advertisements with a given structure but rather whether one particular structure, the repetition-break plot structure, tended to generate more recognition. The searches had a standard form, combining the word "ad" (pilot testing showed it equivalent to "commercial"), the brand name, and the advertisement name (listed on Adforum.com). If no advertisement was found, we dropped part or all of the advertisement name from the search and examined the listings. We searched all advertisements without knowledge of their plot structure to avoid bias. We recorded the number of instances of the advertisement present on YouTube (any given advertisement could be posted more than once) and the total number of views across all instances as of July 9, 2010.

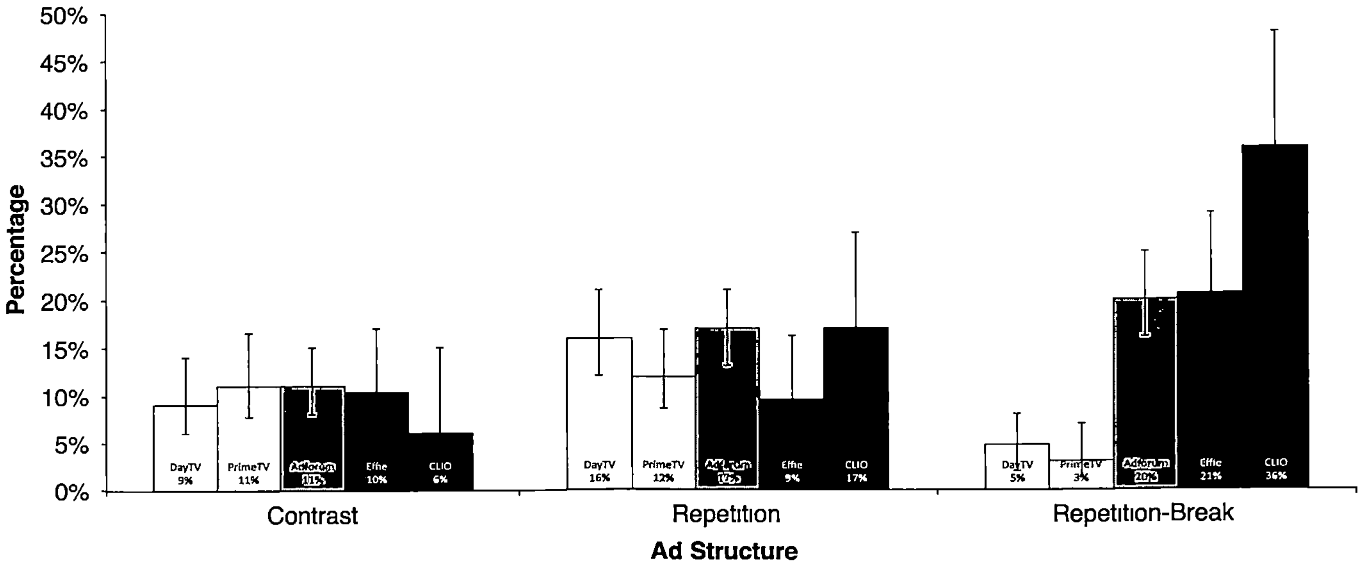
Humor ratings. Because of the potentially close relationship between the plot structures and humor, we generated ratings of the humor of the most selective advertisements as a check for whether humor was necessary for an advertisement's success. We had each of the Effie and Clio gold medal–winning advertisements that were coded as using repetition-break, contrast, or repetition plot structures rated by 15 participants recruited through Amazon's Mechanical Turk online community as to how funny they were (1 = "not at all funny," and 7 = "very funny") and how funny they thought the advertisement was intended to be (1 = "not supposed to be funny," 2 = "supposed to be a little funny," and 3 = "supposed to be very funny").

Results

We found that repetition-break television advertisements increase in proportion as the level of industry selectivity increases. Specifically, we found relatively few repetition-break advertisements in the low-selectivity samples from daytime (5%, 95% confidence interval [CI]: 3%–8%) and prime-time (3%, 1%–7%) television. We found more in the moderate-selectivity sample from Adforum.com (20%, 16%–25%) and the high-selectivity samples from the Effie gold medal winners (21%, 14%–29%) and the Clio gold medal winners (36%, 26%–48%). The trend for the proportion of repetition-break advertisements to increase with increasing levels of selectivity was reliable ($\chi^2(4, N = 958) = 85.42$, $p < .0001$, Cramer's V = .30; see Figure 1). The implication is that repetition-break television advertisements are substantially overrepresented, compared with their low base rate in the population of advertisements broadcast on television, in samples of industry-recognized advertisements. This is consistent with our claim that repetition-break plots provide an advantage for industry selection.

We found little support for claiming that the repetition and contrast plot structures provide advantages for industry selection. The percentage of advertisements using a repetition plot structure was stable across low, medium, and high levels of industry selectivity: daytime television 16% (95% CI: 12%–21%), prime-time television 12% (9%–17%), Adforum.com 17% (12%–22%), Effie gold medal award winners 9% (5%–16%), and Clio gold medal award winners 17% (10%–27%). The percentage of advertisements using a contrast plot structure was also stable across levels of industry selectivity: daytime television 9% (6%–13%), prime-time television 11% (8%–16%), Adforum.com 11% (8%–15%), Effie gold medal award winners 10% (6%–17%), and Clio gold medal award winners 6% (2%–15%). The implication is that repetition and contrast advertisements are selected in rough proportion to their base rates. Thus, these structures can be the basis of effective advertisements, but we do not have evidence consistent with these plot structures conferring selection advantages.

FIGURE 1
Percentage of Advertisements Using Contrast, Repetition, and Repetition-Break Plot Structures



Repetition-break advertisements appear more likely to be selected by industry judges than repetition and contrast advertisements. In the Clio sample, the proportion of repetition-break advertisements was greater than the proportions of repetition advertisements (MacNemar test, $p < .05$) and contrast advertisements (MacNemar test, $p < .0001$). In the Effie sample, the proportion of repetition-break advertisements was greater than the proportion of repetition advertisements (MacNemar test, $p = .05$) and showed a tendency toward being greater than the proportion of contrast advertisements (MacNemar test, $p = .08$). Thus, the repetition-break plot structure seems to contribute, and contribute more than two closely related narrative structures, to industry selection. This supports our claim for the importance of the specific form of the repetition-break plot structure.

Turning to the data on consumer selectivity, we examined the YouTube views for repetition-break, repetition, and contrast advertisements from the Adforum.com sample. Because there were 142 such advertisements and the number of views was strongly skewed (ranging from 1 to 7,062,049), we used the natural log of YouTube views for our analyses. We also combined the repetition and contrast advertisements into one group because of the relatively low number of contrast advertisements and the similar patterns shown by the two types. We found that repetition-break advertisements ($M = 5.33$, $SE = .65$) gathered more YouTube views, on average, than repetition or contrast advertisements ($M = 3.43$, $SE = .53$, $t(140) = 2.27$, $p < .05$). This means that the repetition-break advertisements gathered, on average, about six times more YouTube views than repetition or contrast advertisements. We also found that 38% of the repetition-break advertisements had been posted to YouTube more than once, whereas just 15% of the repetition and contrast advertisements had been ($\chi^2(1, N = 142) = 10.48$, $p < .01$). Thus, repetition-break advertisements appear more likely to be recognized by consumers; in other words, people choose to share and watch them more than advertisements with related plot structures.

We used the corpora to probe for the advertising contexts in which repetition-break advertisements might be particularly effective but found little sign of systematic patterns. Examining the Adforum.com corpus, which was generated according to systematic sampling from national markets and product categories, we found no clear effects of national market (United States, United Kingdom, Canada, and Australia) or product category (apparel, retail, consumer electronics, and beverages) in the proportions of repetition-break, repetition, or contrast advertisements. Across all the corpora, we found that repetition-break advertisements appeared in a broad array of national markets, including the United States, Canada, Argentina, Brazil, Peru, the United Kingdom, France, Germany, Italy, Spain, South Africa, Australia, Malaysia, and Thailand. We found them used for a broad array of product categories, including apparel, automotive, banking, beverages, consumer electronics, insurance, Internet sites, media, retail, and public service. We found repetition-break advertisements for major global brands, including Adidas, American Express, Budweiser, Honda, IKEA, Levi's, and Wal-Mart, as well as much smaller brands, including Aristoc, Bluewater Shopping Centre, Bonjour Paris French School, German Ministry for the Environment, and Nomis shoes. The implication is that the repetition-break plot structure has the potential for broad application.

One interesting consideration, raised by reviewers, was whether in practice the repetition-break plot structure is merely a proxy for humor in advertising. To address this consideration, we gathered ratings for the Effie and Clio gold medal award winners and found that the repetition-break advertisements ($M = 3.25$, $SE = .14$) were no funnier, on average, than repetition advertisements ($M = 3.09$, $SE = .24$, $t(64) = .58$, $p = .56$) or contrast advertisements ($M = 3.24$, $SE = .28$, $t(59) = .01$, $p = .99$). All the plot structures' average ratings were below the midpoint of the scale ($t_{min} = -2.64$, $p_{min} = .02$), implying that in general, the advertisements were not experienced as being particularly funny. (We also note that ad duration was inconsequential here; there was no relationship between humor and the duration of the advertisements [$r(81) = -.09$, $p = .42$], nor did a one-way analysis of variance (ANOVA) show a relationship between duration and ad structure [$F(2,78) = 1.59$, $p = .21$].) In addition, we found a similar pattern in raters' interpretations of the advertisers' intentions for the advertisements to be funny. The repetition-break advertisements ($M = 1.97$, $SE = .07$) were not viewed as having been intended to be funnier than repetition advertisements ($M = 1.88$, $SE = .10$, $t(64) = .79$, $p = .43$) or contrast advertisements ($M = 2.06$, $SE = .12$, $t(59) = -.65$, $p = .52$). Thus, repetition-break, repetition, and contrast advertisements can all be funny, yet repetition-break advertisements are not distinctly funnier than the other structures, and generating humor is not critical for these plot structures to generate highly effective and creative advertisements.

Discussion

Taken together, our results provide support for the claim that the repetition-break plot structure fosters industry and consumer selection of advertisements. The proportion of television advertisements using the repetition-break plot structure increased with higher industry selectivity and accounted for approximately a quarter of two top industry awards in the past decade. This differed from our findings for repetition and contrast, which showed no clear signs of contributing to industry selection. Moreover, repetition-break advertisements gathered more views on YouTube and were more likely to be posted multiple times than contrast and repetition advertisements, evidence that the repetition-break plot structure fosters consumer selection. This evidence is consistent with our claim that there is specific value to the particular sequence of events comprising the repetition-break plot structure.

We argue that the repetition-break plot structure is useful for generating surprise and for more than just humor. We found support that even for Clio and Effie gold medal winners, the repetition-break plot structure is frequently used for other reasons than to be funny. This is supported by some of the comments generated by raters who gave advertisements the lowest humor ratings but clearly found them engaging and effective, such as "It was not funny, but it was exciting to watch, and was definitely attention getting" and "I would rate this as a powerful ad Hits one in the gut Highly memorable "

Marketers could use the repetition-break plot structure far more than they do currently Only about 4% of advertisements drawn straight from television used the plot structure This is consistent with Goldenberg, Mazursky, and Solomon's (1999) finding that only 2 5% of non-award-winning advertisements used the recipes they identified for award-winning advertisements However, we suspect there is opportunity for using the repetition-break plot structure more frequently, because across our entire corpus we found repetition-break advertisements for almost every product category and national market we examined If the plot structure is unfamiliar to marketers, if they have an implicit understanding of it rather than understanding it explicitly as a generic plot structure, or if they believe it is just about having three events or just about being humorous, the evidence in this study provides reasons the format could be used productively much more often than it is currently

Study 2

In addition to television advertisements using the repetition-break plot structure generating industry and consumer attention and accolades, we suggest that repetition-break advertisements should also be persuasive and influence individual consumers' involvement with brands To examine this, we generated an experiment to test individual brand attitudes toward ads with and without repetition-break plot structures

We gathered multiple repetition-break advertisements from the Adforum com database Then, for each advertisement, we generated two kinds of controls The first control is a check on our processing account for why repetition-break advertisements are effective and, specifically, our claim that the initial repetition is useful to prompt people to draw comparisons and thus generate expectations In these controls, we edited out the second, third, or further events that repeated the initial event, leaving the initial event and break event intact We call these "contrast" controls, which arguably remove only redundant information and leave intact the shift from the initial event to the final event that provides a basis for generating surprise For example, in one advertisement, a driver waits at a traffic light and a bicycle rider stops and rests his hand on the driver's car, annoying the driver Traffic advances, the driver once again stops at a traffic light, and then the rider once more stops and rests his hand on the driver's car, annoying the driver again At the third light, the driver backs up just as the bicycle rider arrives and begins to lean on the car, so the rider falls The driver gets his revenge for someone touching his precious car, indicating how attached drivers are to this brand of cars In the edited version of the advertisement, we removed the second event so that the first event led directly to the break event This meant we used repetition-break advertisements with cleanly separable events and both auditory and visual shifts with the final event so that our edits were no rougher than the originals Our corpus analyses suggest these are not limiting restrictions

The second kind of control is a check on the general effectiveness of features of repetition-break advertisements unrelated to its plot structure, but that surely contribute to its effectiveness—the brand, tagline, scenery, music, actors, voiceover talent, production values, and so forth For this second kind of control, which we call "alternative" controls, we identified non-repetition-break advertisements from the same campaign in which repetition-break advertisements appeared Specifically, yoked to each advertisement, we gathered television advertisements from the same campaign, national market, design firm, and year that did not use a repetition-break plot structure Whenever possible, we gathered a randomly drawn set of three, rather than just one, non-repetition-break advertisement per campaign so that our results would not be unduly biased by our selection of one particular alternative advertisement Still, our search was restricted to campaigns that we could access, with multiple advertisements with different plot structures We attempted to compensate by maximizing the range of product categories and levels of brand familiarity that the target advertisements covered and by using multiple alternative advertisements per repetition-break advertisement The result was a collection of three kinds of advertisement (repetition-break, contrast, and alternative) for each of seven brands We expected advertisements with repetition-break plot structures to generate more favorable brand attitudes than the contrast and alternative advertisements not using the plot structure

Methods

Participants A total of 136 junior and senior undergraduate students participated as part of a larger study to earn course extra credit Their mean age was 21 2 years, 59% were female, 49% were white, and 80% were native English speakers Exploratory data analyses revealed no notable relationships between these demographic variables and the attitude toward the brand dependent measure

Materials and procedure We gathered advertisements from Adforum com because it tracks useful information about advertisements and because it enabled us to leverage our corpus analysis We identified the subset of repetition-break advertisements whose events were separated by editing cuts, thereby allowing us to form edited controls with minimal disruption to the advertisements Of these, we removed those for which Adforum com did not have additional advertisements available from the same campaign to serve as alternative controls Next, we removed any sets for which there were differences among the advertisements in any awards they had won, according to the listings in the Adforum com database Finally, we dropped sets for brands from the same product category The result was that we identified sets of advertisements for seven target brands Adidas, Budweiser, Cotton, Fiat, IKEA, Nabob Coffee (a Kraft brand sold in Canada), and Wal-Mart We used the characteristics of the final set of advertisements (e g , product categories, years in which they were shown) to identify non-repetition-break advertisements from three comparably distinct brands to use as fillers Crocs, Sony, and Wendy's

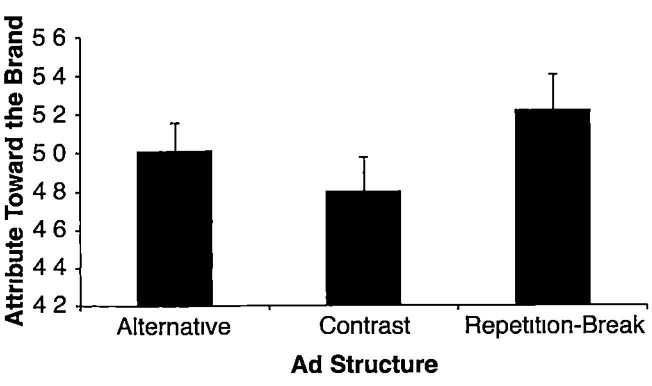
Participants each watched ten advertisements (seven targets and three fillers) and, after each one, gave a series of ratings Participants rated filler advertisements first, to become familiar with the ratings scales and procedure, and then subsequently rated the target advertisements Each participant saw a randomly selected kind of advertisement—repetition-break, contrast, alternative—for each of the seven target brands, presented in one of six randomly generated orderings Thus, each participant saw, on average, two or three repetition-break advertisements, two or three contrast advertisements, and two or three alternative advertisements Across participants, every kind of advertisement was rated for every brand in each order For each advertisement, participants first rated their attitude about the brand (e g , Grier and Deshpandé 2001), which consisted of bipolar seven-point scales assessing their attitude toward the brand in the advertisement they had just seen "favorable/unfavorable," "good/bad," "pleasant/unpleasant," and "high quality/low quality" (α = 94) Participants were also asked whether they had seen the advertisement before

Results and Discussion

We found clear effects of the narrative structures in the advertisements We used a 3 (structure repetition-break, contrast, alternative) × 7 (Brand Adidas, Budweiser, Cotton, Fiat, IKEA, Nabob Coffee, and Wal-Mart) mixed-measures ANOVA to examine the attitude toward the brand measure, controlling for participant and order of presentation We found main effects of structure (F(2, 787) = 7 91, p < 001) and brand (F(6, 763) = 53 51, p < 001) We followed up the main effect of structure with planned contrasts We found that participants had more positive attitudes about the brand after seeing the repetition-break advertisements for the brand (M = 5 22, SE = 09) than the contrast advertisements (M = 4 79, SE = 09, F(1, 781) = 15 82, p < 001) and the alternative advertisements (M = 5 01, SE = 08, F(1, 806) = 4 67, p < 05, Figure 2) The repetition-break plot structure is persuasive, generating an advantage for people's brand attitudes

Examining both contrast and alternative controls helps rule out some possible explanations for the repetition-break advantage Contrast controls offer the same advertisement, preserving the underlying shift between initial event and break, but without the arguably redundant repetitions Alternative advertisements offer intact versions of comparable advertisements from the same advertising campaign Contrast controls are, by definition, shorter than the repetition-break advertisements from which they were derived Although we had no theoretical reason to expect that duration would enhance ratings—longer advertisements provide more opportunities to be tedious (Woltman Elpers, Wedel, and Pieters 2003)—we nevertheless ran an analysis to assess the relationship between ad duration and ratings We examined the relationship between duration (ranging from 15 to 61 seconds) and mean brand attitude ratings for the alternative and filler advertisements because this gives the cleanest assessment of the effects of ad duration separate from any effects of the repetition-break plot structure We found no clear relation between duration and ratings (r(18) = 198, p = 43, absent one outlier, the correlation drops to 02) Thus, we have a stronger basis for claiming that there is something important about the structure of the advertisements than for claiming that it is their duration that was the critical factor

FIGURE 2
Attitude Toward the Brand Ratings for Alternative, Contrast, and Repetition-Break Advertisements from Study 2



The main effect of brand that we found indicated that advertisements for the different brands generated varying brand attitudes From highest to lowest brand attitudes, they were as follows Adidas (M = 5 89, SE = 12), IKEA (M = 5 66, SE = 11), Cotton (M = 5 50, SE = 11), Budweiser (M = 5 16, SE = 11), Fiat (M = 4 61, SE = 11), Wal-Mart (M = 4 43, SE = 11), and Nabob Coffee (M = 3 81, SE = 11) The differences across brands are large relative to the effect of plot structure, suggesting that the nature of the brand and overall choices for the ad campaign (in terms of style, music, setting, tagline, and so forth) set an intercept for participants' ratings, which was then modulated by plot structure The advantage of the repetition-break plot was robust across brands As a simple indication, the qualitative patterns of the raw means shows that the repetition-break advertisement was more highly rated than the contrast advertisement for six of the seven brands and was more highly rated than the alternative advertisement for five of the seven brands Thus, we find robust support for the claim that advertisements using the repetition-break plot structure provide an advantage for influencing people's brand attitudes

Study 3

Study 3 examines repetition-break advertisements in more detail The first extension was that in addition to asking participants for their attitudes toward the brand, we also examined how engaging they believed the advertisement itself was We follow research suggesting that advertisements requiring attention and involvement on the part of consumers, such as to decode resonance (McQuarrie and Mick 1992) or be transported by a narrative (Wang and Calder 2009), are likely to be engaging and therefore effective Because our interest was in whether the repetition-break plot structure could yield engaging advertisements, we asked about aspects of an advertisement's effectiveness that reflected the full progression of engagement Specifically, we asked people for their impressions of how surprising the advertisement itself was because part of the logic for the effectiveness of the repetition-break plot structure is that it should generate surprise with the break. We asked about the appeal of the story conveyed in the advertisement because we suggest that the comparison and surprise generated by the repetition-break plot structure should generate engaging narratives. We also asked whether people would be likely to share the advertisements with others because strong engagement predicts a willingness to share stories (Heath, Bell, and Sternberg 2001). Thus, in contrast to existing attitude toward the ad measures, which tend to focus on the surface appeal of the advertisement (Is the ad attractive or eye-catching?), we were concerned with a more substantial level of engagement in the advertisement; therefore, we incorporated multiple indicators of that engagement. Our prediction was that an advertisement with the repetition-break plot structure should be more engaging than one without. Moreover, engagement should mediate the effect of the plot structure on people's attitudes toward the brand.

The second extension was that we varied how we presented the advertisements. In Study 2, participants viewed them one at a time and then rated them immediately. In this study, we varied the presentation of advertisements, showing them either in isolation or embedded in a sequence of mundane advertisements. Because television advertisements are often shown in sequences of four to nine advertisements in breaks during or between shows, we sought to address whether the effect of the repetition-break plot structure would be maintained, heightened, or suppressed when an advertisement using the structure was embedded in a sequence of mundane, non-repetition-break advertisements. We had reason to believe that the advantage of the repetition-break plot structure might be heightened, given that we have argued that advertisements using the structure should be more engaging than those not using it, helping them to be distinctive. To ensure that we were comparing attitudes toward ads in isolation versus ads embedded in a mundane sequence rather than immediate responses versus recollections, we gave all participants a brief filler task between viewing and rating the target advertisement. As a result, in Study 3, we compared repetition-break and contrast versions of an advertisement when it was shown individually and when it was shown embedded in a sequence of filler advertisements, looking for differences in engagement and brand attitudes.

Methods

Participants and design. We gathered data from 276 participants using online survey subject pools. The participants were 63% female, 83% white, and 97% native English speakers. They averaged 37 years of age (SD = 13 years), the modal education level was to have completed a bachelor's degree, 58% were currently employed, and on average they had worked full time for 13 years (SD = 12 years). We drew from two online recruitment sources, Amazon's Mechanical Turk community (n = 162) and a major business school's online pool (n = 114). Because demographic differences (e.g., the business school's pool participants were, on average, four years older) and differences in measured variables of interest (e.g., a dummy variable coding for recruitment source yielded no effect) between these groups were minimal, we collapse across them in presenting the results. Participants were randomly assigned to one of four conditions according to a 2 (structure: repetition-break or contrast) × 2 (presentation: isolated or embedded) design.

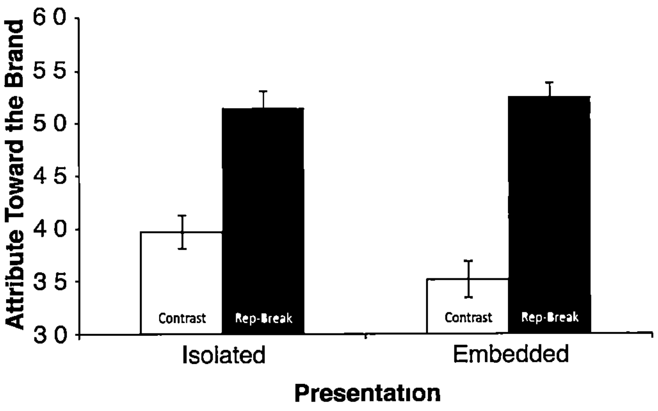
Materials and procedure. We presented participants with the repetition-break and contrast versions of the Adidas television advertisement used in Study 2. Participants in the embedded condition saw the target Adidas advertisement in the middle of a stretch of seven advertisements, the other six being filler advertisements for Sony, Wendy's, Crocs, IKEA, Cotton, and Wal-Mart. After an unrelated task lasting approximately one minute, participants were shown still frames from the target Adidas advertisement to identify the advertisement of interest. Then they were asked how engaging it was, their attitude toward the brand Adidas using the scale from Study 1 ($\alpha = .94$), and whether they had seen that advertisement before (4.7% had). Our measure of engagement consisted of three questions ($\alpha = .80$): How surprising was the ad (1 = "not at all surprising," and 7 = "very surprising")? How appealing did you find the story in the ad (1 = "not at all appealing," and 7 = "very appealing")? and How likely are you to show the ad to someone else (1 = "not at all likely," and 7 = "very likely")? Last, they provided demographic information.

Results

We replicated the advantage for the repetition-break plot structure over the contrast plot structure from which we removed the initial repetition. We used a 2 (structure) × 2 (presentation) ANOVA to examine people's attitudes about the brand. Because we were using one target advertisement and had a more diverse sample, we considered covariates for sports experience, sex, age, education level, filler task delay, and whether participants had seen the advertisement before, but these did not substantively change the pattern of results. We found a main effect of structure ($F(2, 275) = 11.83$, $p = .001$, mean square error = 1.68) because repetition-break advertisements (M = 5.52, SE = .10) prompted more favorable brand attitudes than contrast advertisements (M = 4.96, SE = .12). There was no main effect of presentation ($F(1, 275) < 1$), but there was a marginal interaction of structure and presentation ($F(1, 275) = 3.59$, $p = .059$). This trend was due to the advantage of the repetition-break version over the contrast version being larger when the advertisements were embedded in a longer series of advertisements (5.65 vs. 4.84) than when they were shown in isolation (5.38 vs. 5.07; Figure 3).

Extending these findings, we also found an advantage for the repetition-break plot structure over the contrast plot structure on participants' engagement with the advertisements. A parallel 2 (structure) × 2 (presentation) ANOVA indicated that repetition-break advertisements (M = 5.20, SE = .11) were more engaging than contrast advertisements (M = 3.75, SE = .12; $F(1, 275) = 81.50$, $p < .001$). Again, there was no reliable main effect of presentation ($F(1, 275) =$

FIGURE 3
Attitude Toward the Brand Ratings for Contrast and Repetition-Break Advertisements from Study 3



1 86, p = 174), but there was an interaction between structure and presentation (F(1, 275) = 3 98, p < 05) This was due to the advantage of the repetition-break plot structure over the contrast structure being larger when the advertisement was embedded (5 25 vs 3 51) than when it was shown individually (5 15 vs 3 97)

The parallel findings for ad engagement and attitude toward the brand were related Participants' degree of engagement with the advertisements partially mediated the effect of plot structure on brand attitudes Using Baron and Kenny's (1986) method, we concluded that plot structure predicted engagement (B = 1 43, SE = 16, t = 9 00, p < 0001) Engagement predicted attitudes toward the brand (B = 65, SE = 05, t = 14 37, p < 0001) In turn, we saw that plot structure predicted attitudes toward the brand (B = 55, SE = 16, t = 3 53, p < 001), and this effect was significantly reduced (Sobel Z = 7 61, p < 0001), though still reliable (B = 37, SE = 14, t = 2 76, p < 01), when engagement was in the model We found consistent evidence of mediation using Preacher and Hayes's (2004) bootstrapped method This analysis revealed a significant indirect effect of plot structure through engagement on attitudes toward the brand, with the size of the effect being 93 (SE = 13, 95% CI 70–1 20)

Discussion

Experiment 3 provides increased evidence for the advantages of the repetition-break plot structure We replicated the key finding that a television advertisement using the repetition-break plot structure yields more favorable attitudes toward the brand than that same advertisement with the initial repetition removed We shed further light on the effect by showing that the repetition-break plot structure seems to confer broad advantages for people's engagement with an advertisement, encompassing increased surprise, increased appeal for the story conveyed by the advertisement, and an increased interest in sharing the advertisement with someone else In turn, participants' level of engagement partially mediated the effect of plot structure of people's brand attitudes This is initial suggestive evidence that the repetition-break plot structure can make for more compelling advertisements and, because of that, is persuasive in that it enhances perceptions of the brand

We also found that the advantage of the repetition-break plot structure held up or increased when we presented the advertisement embedded in a series of advertisements Participants watching a string of advertisements might have become bored or numb to the particulars of the advertisements but instead seemed drawn in by the repetition-break advertisement The implication is that by being engaging, the repetition-break plot structure can help advertisements stand out from a crowd

Study 4

Our account of why repetition-break advertisements work suggests they are engaging and persuasive We have initial support for the claim that repetition-break advertisements increase brand attitudes and do so because they are engaging In Study 4, we broaden the empirical support for this claim and separate these claims from related concerns We extend Study 3 by continuing to examine the effectiveness of a target advertisement embedded in a sequence of advertisements, expanding our sample to three target brands and including alternative controls We again examine brand attitudes and ad engagement and also ask about purchase intentions We contrast these involving, persuasive measures with a simpler brand attention measure Do people recognize and recall the brands they saw advertised? We do not predict that repetition-break advertisements should yield an advantage for the brand attention measures relative to the contrast and alternative advertisements It is even plausible that they do worse Because repetition-break advertisements tend not to mention the target brand until the break event (note that this is a tendency we have noticed, not a requirement of the plot structure), they might yield lower performance on brand attention measures than advertisements that mention the target brand throughout the advertisement Thus, our processing account leads us to predict that repetition-break advertisements should yield advantages on persuasion measures but not brand attention measures

As a secondary point, we wanted to separate the engagement that we argue is critical for repetition-break advertisements from humor, which we argue is just one of multiple possible ends to which repetition-break advertisements can be aimed Accordingly, we gathered participants' assessments of how humorous the advertisements were so that we could compare humor and engagement as drivers of the effect of the repetition-break plot structure on involving, persuasion measures such as brand attitudes and purchase intentions

Method

Participants A total of 220 junior and senior undergraduate students participated as part of a larger study to earn course extra credit Their mean age was 20 7 years, 61% were female, 44% were white, and 68% were native English speakers Exploratory data analysis revealed no interactions between these demographic variables and the key dependent measures, so we do not discuss them further

Materials, design, and procedure Participants saw one of three target advertisements (for the brands Adidas, Fiat, or Cotton), embedded in the middle of six filler advertisements (for the brands Wal-Mart, Nabob, Diet Coke, Sony, KPMG, and Wendy's) The target advertisement was a repetition-break, contrast control, or alternative control Thus, we used a 3 (structure repetition-break, contrast, alternative) × 3 (brand Adidas, Fiat, Cotton) design After viewing the advertisements, participants engaged in an unrelated filler task for an average of eight minutes and then answered a series of questions about the advertisements

First, we measured brand attention We asked participants to recall all the brands for which they saw advertisements and tallied whether they correctly wrote the target brand as a measure of brand recall We then gave participants a list of brands and asked them to identify their degree of confidence that they did or did not see an advertisement for each brand as a measure of brand recognition Half the brands they had seen before and half they had not, and we included as foils brands from the same product category as the target brands

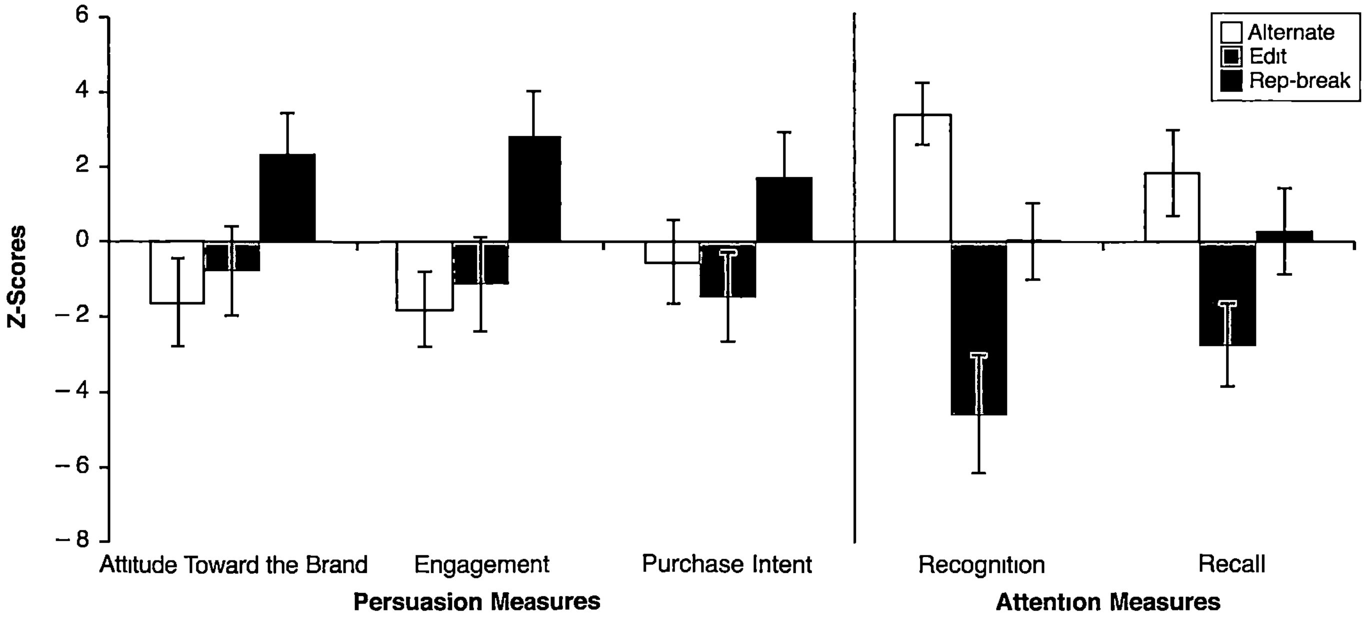
Next, we gathered persuasion measures We showed participants three frames from the target advertisement and then asked them to answer the brand attitude (α = 94) and engagement (α = 87) items used in Study 3 We assessed their purchase intentions by asking the degree to which they agreed with two statements (α = 94) "The next time I need [product type], I intend to consider [brand]," and "The next time I consider buying [product type], I intend to purchase a [brand] product " We also asked them to rate how funny the advertisement was (1 = "not at all funny," to 7= "very funny"), as well as whether they had seen the advertisement before

Results

As predicted, we found that repetition-break advertisements garnered higher evaluations than the contrast and alternative controls on the persuasion measures but not on the brand attention measures (Figure 4) To reach this assessment, we conducted a series of 3 (structure repetition-break, contrast, alternative) × 3 (brand Adidas, Cotton, Fiat) ANOVAs to examine each measure—brand attitudes, engagement, purchase intentions, brand recognition, and brand recall These showed consistent main effects of structure as well as predictable orthogonal main effects of Brand consistent with Study 2 Therefore, to save space in what follows, we emphasize planned contrasts between repetition-break and contrast advertisements and between repetition-break and alternative advertisements

We assessed three persuasion measures attitudes about the brand, engagement, and purchase intentions We found that repetition-break advertisements (M = 5 50, SE = 17) yielded higher brand attitudes than contrast advertisements (M = 5 00, SE = 19, F(1, 219) = 2 09, p < 05) and alternative advertisements (M = 4 86, SE = 18, F(1, 219) = 2 86, p < 01) We found that repetition-break advertisements (M = 4 32, SE = 21) yielded higher levels of engagement than contrast advertisements (M = 3 62, SE = 22, F(1, 219) = 2 91, p < 01), and alternative advertisements (M = 3 51, SE = 18, F(1, 219) = 3 66, p < 001) We also found that repetition-break advertisements (M = 3 42, SE = 22) yielded stronger purchase intentions than contrast advertisements (M = 2 82, SE = 22, F(1, 219) = 2 27, p < 05) and a marginal trend toward stronger purchase intentions than alternative advertisements (M = 3 00, SE = 21, F(1, 219) = 1 69, p = 09) Taken together, these results support our prediction that repetition-break advertisements, even, or perhaps particu-

FIGURE 4
Persuasion and Attention Measures (Transformed to z-Scores for Comparability) for Alternative, Contrast, and Repetition-Break Advertisements from Study 4



larly, those embedded in a string of other advertisements, would generate higher levels of involvement and persuasion than contrast and alternative advertisements

We assessed two brand attention measures brand recall and brand recognition We found a markedly different pattern for these measures than for the persuasion measures The alternative advertisements tended to prompt the strongest performance The brand recognition measure showed that repetition-break advertisements (M = 8 70, SE = 37) were more confidently recognized than contrast advertisements (M = 7 05, SE = 22, F(1, 219) = 3 33, $p <$ 01) but less confidently recognized than alternative advertisements (M = 9 91, SE = 29, F(1, 219) = –2 64, $p <$ 01) The brand recall measure showed that repetition-break advertisements (M = 38, SE = 06) tended to be more likely to be recalled than contrast advertisements (M = 23, SE = 05, F(1, 219) = 1 96, $p =$ 05) but, if anything, were less likely to be recalled than alternative advertisements (M = 45, SE = 06, F(1, 219) = –1 07, $p =$ 29) Thus, as we predicted, repetition-break advertisements show no particular advantage on brand attention measures and tended to lead toward worse performance on the attention measures than alternative advertisements

The data also support our claim that being engaging is important to the effectiveness of repetition-break advertisements, irrespective of whether they are funny Overall, repetition-break advertisements (M = 3 48, SE = 14) were rated as funnier than alternative advertisements (M = 2 48, SE = 14, F(1, 219) = 5 76, $p <$ 001) and showed a nonsignificant tendency to be funnier than contrast advertisements (M = 3 03, SE = 17, F(1, 219) = 1 35, $p =$ 18) However, in mediation analyses examining engagement and humor as mediators of the effect of the repetition-break plot structure on brand attitudes and purchase intentions, we found that greater engagement and *lower* humor ratings predicted brand attitudes and purchase intentions Specifically, using Preacher, Rucker, and Hayes's (2007) approach, we found a positive coefficient for the indirect effect of repetition-break through engagement on brand attitudes (30, SE – 11, 95% CI 11– 53) and a negative coefficient for the indirect effect of repetition-break through humor on brand attitudes (– 12, SE – 06, 95% CI – 26— 03) Similarly, we found a positive coefficient for the indirect effect of repetition-break through engagement on purchase intentions (20, SE = 08, 95% CI 06– 44), and a negative coefficient for the indirect effect of repetition-break through humor on purchase intentions, (– 23, SE = 09, 95% CI – 47 to – 07) Thus, it seems reasonable to conclude that repetition-break advertisements need not be funny to be effective

Discussion

We found that repetition-break advertisements are persuasive They lead to advantages in engagement and, thus, advantages in brand attitudes and purchase intentions compared with contrast versions that eliminate the opportunity to draw comparisons and alternative advertisements from the same campaign that did not use repetition-break plot structures We found no particular advantage or even disadvantages in brand attention measures (i e , brand recognition and brand recall) Thus, repetition-break advertisements are not an all-purpose tool for marketers If the function of an advertisement is mainly to remind consumers of a brand in between purchase cycles, a repetition-break plot structure may not be the best choice Instead, repetition-break advertisements are useful for high-involvement concerns such as attempts at increasing, rather than reinforcing, brand attitudes and purchase intentions

We also found that humor was distinct from engagement and that repetition-break advertisements did not need to be funny to be effective As indicated by the Peruvian Cancer Foundation advertisement, the original "Priceless" World Series advertisement, and the findings in Study 1, repetition-break advertisements can engage and persuade consumers without being funny

General Discussion

We investigated a new kind of advertisement structure, the repetition-break plot structure, thereby bridging research on narratives in advertising (e g , Adaval and Wyer 1998, Stern 1994) and research on advertisement structures (e g , Goldenberg, Mazursky, and Solomon 1999, McQuarrie and Mick 1996, Pieters, Wedel, and Batra 2010) We have shown that the repetition-break plot structure generates engaging advertisements Using empirical and experimental studies, we gathered evidence that naturally occurring advertisements for contemporary brands that use repetition-break plot structures are more likely than those with related plot structures or those from the same campaign to be selected by industry judges, to be posted and viewed on YouTube, and to enhance people's brand attitudes We found that removing the initial repetition from repetition-break advertisements led to lower brand attitudes, consistent with our claim of the importance of comparing initial events We found that repetition-break advertisements generated more favorable brand attitudes than those with different plot structures from the same campaign, providing further support that there is value to the plot structure beyond other campaign choices Thus, we have robust and varied evidence of the value of the repetition-break plot structure in television advertisements

We also have evidence for why and when the repetition-break plot structure is effective We found that engagement with the narrative in the advertisement served as a mediator between the plot structure and people's brand attitudes Repetition-break advertisements are more engaging than otherwise similar advertisements We found signs that a repetition-break advertisement generated a greater advantage over a version edited to remove the initial repetition when the advertisement was viewed in a block of advertisements, indicating that the repetition-break plot structure helps advertisements stand out in a cluttered media environment We found that repetition-break advertisements are effective for persuading and enhancing brand attitudes but are not particularly effective and possibly counterproductive for maintaining brand awareness As a result, repetition-break advertisements are not all-purpose advertising solutions but an ad structure targeted for specific marketing purposes We can guide marketers in why and when to use the repetition-break plot structure in their campaigns

Our theoretical description of the repetition-break plot structure clarifies how the structure uses comparison to engage viewers and set the basis for endogenous surprise, which does not depend on differing from preexisting expectations Using comparison to generate an expectation gives advertisers more flexibility in creating engagement in a diverse audience whose members may not share similar expectations Managers face a daunting challenge in attracting multiple segments of consumers The repetition-break plot structure provides a promising, flexible tool for engaging a broad array of consumers in a cluttered media environment

From a practical perspective, there is much room for expanded use of the repetition-break plot structure We found instances of advertisements using the plot structure for product categories ranging from apparel to public service and in countries ranging from Argentina to Thailand Nonetheless, the plot structure is infrequent in day-to-day use A mere 3% of prime-time television advertisements employ it Therefore, we believe there is a large untapped potential for them

Repetition-break advertisements are likely to be particularly helpful in competitive situations for which advertisers need to engage with consumers to enhance brand attributes, reposition their already established brand, create social buzz by generating advertising that people are likely to want to pass along, or challenge a dominant competitor In these situations, the additional engagement provided by the repetition-break plot structure will be particularly useful Our results show that the repetition-break plot structure is a way of enhancing the degree to which consumers think and feel about an advertisement and the brand that sponsors it Repetition-break advertisements will be particularly useful in situations in which an advertiser needs a consumer to engage intellectually with the brand (e g , to understand a novel product benefit) or to engage emotionally with the brand (e g , to be moved enough to try an upstart brand or donate to a nonprofit)

For example, it is no accident that MasterCard gained strong benefits from the repetition-break plot structure in its “Priceless” campaign against the more dominant Visa brand But MasterCard was already a well-established brand, and this structure may be even more productive when resources are constrained, as for a Peruvian cancer center that is trying to get attention on a nonprofit budget One of the most widely reposted and viewed advertisements on YouTube was an advertisement for Pure Blonde beer, then a new Carlton brand for the low-calorie beer market, which contributed to what *Australian Financial Review* reported was a 137% sales increase In an environment in which companies are increasingly interested in the power of social media, the repetition-break plot structure provides an easy way for increasing the odds that someone will pass along a piece of advertising Through their actions, individual consumers are at least implicitly recognizing that this plot structure might engage a wide variety of their colleagues and friends to respond predictably with laughter or tenderness, even if differences among their social network might produce more heterogeneous responses to a different form of advertisement

Our findings show there are qualifications to using repetition-break advertisements There are times when marketers should probably not use them Specifically, when the marketers’ objective is to build or sustain brand awareness, alternative plot structures may work as well as or better than the repetition-break plot structure If a marketer’s objective is convey multiple pieces of information rather than one focused claim, repetition-break advertisements will probably be less effective than other approaches as well because the structure is geared toward focusing viewers on one focal point In additional research, we also found that when viewers have very low levels of cognitive capacity (e g , due to a strong cognitive load manipulation), plot structure effects are attenuated The implication is that consumers need to have the capacity to become engaged for the repetition-break plot structure to contribute to an advertisement’s effectiveness This is consistent with McQuarrie and Mick’s (2003) conclusion that consumers must have the ability, opportunity, and motivation to process an advertisement that uses rhetorical structures Alternatively, it is possible that there are ways to use the repetition-break plot structure that require less cognitive effort (Rozin et al 2006), such as keeping the repetitions identical and the break minimal, that marketers could pursue Still, the choice to produce repetition-break advertisements should be evaluated against both the marketer’s objectives and the context in which consumers are likely to view the advertisements

There are two promising lines for further research The first is to examine the time course of the engagement produced by the repetition-break plot structure In the current studies, we used self-report measures of people’s accounts of engagement and integrated multiple aspects of engagement However, the processing account we provide suggests that initial comparisons should be engaging and critical to establishing surprise at the break, which should then further heighten engagement and generate appeal for and attributions about the product and brand Moment-by-moment analyses have proved useful for examining humor in advertising (Woltman Elpers, Mukherjee, and Hoyer 2004) Close analysis of the time course of involvement with repetition-break advertisements could also prove fruitful

The repetition-break plot structure is just one of many possible plot structures that might serve as a recipe for structuring effective advertisements Accordingly, a second area we suggest for further research is to examine additional plot structures and eventually develop a taxonomy of plot structures Scholars have generated taxonomies to organize findings showing that there are multiple effective types of strategic functions (e g , promoting a brand image or positioning relative to a competitor, Frazer 1983, Laskey, Day, and Crask 1989) and multiple effective modes of influence (e g , informational or emotional, Aaker and Norris 1982, Vakratsas and Ambler 1999) These frameworks are useful for articulating an advertisement’s high-level goals Work on recipes for structuring advertising content offers a complementary purpose—namely, to show how an advertiser could construct high-performing advertisements Repetition-break advertisements are an additional step toward building a library of effective advertising recipes

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C. Page Moreau, Leff Bonney, & Kelly B. Herd

It's the Thought (and the Effort) That Counts: How Customizing for Others Differs from Customizing for Oneself

While interest in customization is growing among consumers and academics, researchers have focused on consumers designing products for themselves Many customization firms, however, are successfully positioning themselves as key sources for unique gifts In this research, the authors examine whether factors under the firm's control (i e , the level of design support provided and the presence of a strong brand) are differentially effective when consumers design products for themselves or as gifts for others Using participants drawn from the relevant target market, they report two studies involving real customization tasks undertaken on fully functioning customization websites The findings lead to the surprising conclusion that design support is less effective for consumers designing products intended as gifts rather than for themselves, raising expectations without a corresponding rise in evaluations However, the results offer some good news to firms targeting gift-giving consumers Both Studies 1 and 2 reveal that gift-givers place a higher value on their own time and effort and thus report a higher willingness to pay than those designing for themselves This effect is diminished, however, when a strong brand is present and consumers share credit with the brand for the product's design

Keywords customization, gift, gift-giving, brand, design

According to the *New York Times*, customization firms are enjoying tremendous growth, with industry leaders Zazzle and CafePress reporting annual increases greater than 80% (Miller 2009) Even as overall growth in e-commerce sales slows to single-digits, consumers are increasingly choosing to create one-of-a-kind products across a wide range of categories Importantly, recent research has demonstrated that consumers are willing to pay a significant premium for these customized products relative to their comparable mass-produced counterparts (Franke, Keinz, and Steger 2009, Franke and Piller 2004) This customization research, however, has focused exclusively on consumers designing products for themselves (e g , Franke, Keinz, and Steger 2009, Franke, Schreier, and Kaiser 2010, Moreau and Herd 2010) As spikes in holiday sales suggest, many customization firms are successfully positioning themselves as key sources for unique gifts (Miller 2009)

In this research, we examine whether factors under the firm's control (i e , the level of design support provided and the presence of a strong brand) are differentially effective when consumers design products as gifts for others rather than for themselves Because gifting situations impose unique challenges on consumers, we expect that they will To be a successful giver, a consumer must predict the recipient's preferences, select or create a product to match those preferences, and do so in a way that communicates the value of the recipient and their relationship (Belk 1996) The challenges associated with gifting situations often create a specific type of anxiety for givers that is uncharacteristic of self-purchasing situations (Wooten 2000)

In customization settings, design support can reduce anxiety and improve customer satisfaction in categories in which consumers lack the requisite knowledge to design a product (e g , computers, see Randall, Terwiesch, and Ulrich 2005, 2007) Design support is likely to play a similar role in gifting situations because the giver often lacks the requisite knowledge to correctly predict the recipient's preferences Thus, the influence of design support should be greater when consumers design for others rather than for themselves Similarly, a firm's use of a strong brand name is likely to be differentially effective when consumers are customizing a product as a gift rather than for themselves Prior research has shown that recipients value gifts to a greater degree when the behavioral costs to provide them (e g , the effort the giver invests in identifying and/or creating an ideal gift) are perceived as high (Robben and Verhallen 2004) When a strong brand name is placed on a customized product, the recipient may give the brand, not the giver, credit for its design Recognizing this possibility, the giver may place less value on his or her own design efforts

Using participants drawn from the relevant target market, we test for these differential effects in two studies involving

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real customization tasks undertaken on fully-functioning websites Together, the studies demonstrate that consumers' willingness to pay for their customized products is influenced by two important factors satisfaction with the product at delivery (Study 1) and the value consumers place on their own behavioral resources (i e , the correlation between their effort and willingness to pay, Studies 1 and 2) In turn, both factors are influenced jointly by the intended product recipient (self vs other) and either the level of design support provided by the firm or the presence of a strong brand (see Figure 1)

How Customizing for Others Differs from Customizing for the Self

Customization enables consumers to design a unique product by selecting each of the product's attributes from a wide array of options In many of these customization contexts, the toolkits consumers use offer an almost infinite set of combinations, which can lead to frustration or confusion on the consumer's part (Huffman and Kahn 1998, Iyengar and Lepper 2000) This possibility is enhanced when consumers "lack insight into their own preferences," as behavioral decision theory suggests is often the case (Valenzuela, Dhar, and Zettelmeyer 2009, p 761, see also Bettman, Luce, and Payne 1998, Chernev, Mick, and Johnson 2003, Franke, Keinz, and Steger 2009, Simonson 2005) Thus, for many consumers, customizing products for oneself can result in frustration or anxiety (Valenzuela, Dhar, and Zettelmeyer 2009)

A different type of anxiety is created by a gifting context (Wooten 2000) The stakes in the gifting process can be high Unsuitable gifts can cause embarrassment to both the giver and the recipient, jeopardizing valued social relationships (Sherry, McGrath, and Levy 1993, Wooten 2000) Thus, a giver's unfamiliarity with the recipient's preferences (i e , their "lack of knowledge about the recipients' tastes, wants, or needs") is one major contributor to anxiety during gift selection (Wooten 2000, p 92) A second major contributor is social anxiety, the anxiety that occurs when people "are motivated to make desired impressions but are doubtful of success" (Wooten 2000, p 85, see also Schlenker and Leary 1982) Social anxiety stems from a concern about being evaluated by others and is at its highest when a giver is highly motivated to make the right impression on the recipient yet believes that his or her chances of success are relatively low (Wooten 2000)

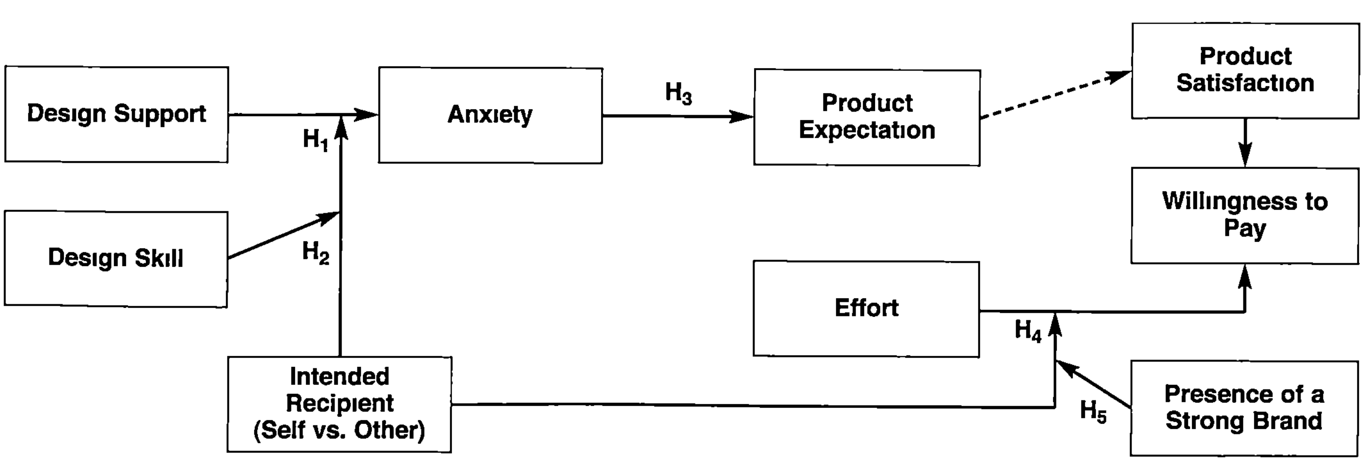
In summary, both the customization process itself and the selection of a gift for someone else can produce anxiety in consumers What factors influence this anxiety, and what can firms do to alleviate some of it? In the following sections, we discuss the role of design support and self-perceived design skill

Design Support and Anxiety

In functional customization tasks (e g , selecting the different attributes of a Dell computer, such as processing speed and storage capacity), design support has been shown to be particularly helpful for consumers who lack the requisite category knowledge to design the product (Randall, Terwiesch, and Ulrich 2005, 2007) However, in aesthetic customization tasks (e g , selecting the colors for a shoe), category knowledge is less relevant In these tasks, the most relevant knowledge is the designer's knowledge of the intended recipient's preferences Consumers designing products for themselves have direct access to their own preferences (even if those preferences are not well established) Those designing for others, however, do not have direct access to the recipient's preferences and thus need to predict them

Davis, Hoch, and Ragsdale (1986, p 25) find that consumers attempting to predict the preferences of others tended to anchor on their own preferences "and attempt to adjust for ways in which we are likely to differ from others " The real difficulty lies in identifying the "adjustment factors" that are more diagnostic of the others' preferences than of their own (Davis, Hoch, and Ragsdale 1986, p 25) We propose that design support can help consumers make those adjustments because the recommendations offered are presumably based on preference information aggregated

FIGURE 1
Conceptual Overview



from a wider population of consumers Access to this type of generalized preference information would likely reduce the anxiety created by a giver's lack of knowledge regarding the recipient's preferences by helping them make the appropriate adjustments However, this type of generalized information will not likely be as effective in reducing anxiety for consumers designing for themselves because it may do little to help them understand their own unique preferences More formally,

H_{1a} When a product is designed as a gift, the provision of design support decreases consumers' anxiety at the time of design

H_{1b} When a product is designed for oneself, these effects are attenuated

Self-Perceived Design Skill and Anxiety

The consumer's belief about his or her own design skill is also likely to contribute to the anxiety experienced during a customization task As with design support, the influence of these beliefs is likely to differ depending on the product's intended recipient Recall that social anxiety arises from a person's concern with being evaluated by others In a gifting context, this anxiety is elevated when the person believes that his or her chances of making a good impression are relatively small Self-perceived design skill likely contributes to the giver's assessment of his or her chances of making that good impression Thus, lower self-perceived design skill is likely to contribute to anxiety when the consumer is designing for someone else, and this effect is likely to be particularly pronounced when no design support is provided

When a consumer is designing for him- or herself, however, social anxiety is less of a concern These self-designers may still be concerned about being evaluated by others when *using* the product, but consumers who are disappointed by the outcome of the customization task can simply choose not to use the product in public, thereby avoiding social judgments Conversely, givers will not know whether the recipient is disappointed until after the gift is given and the exposure to social judgment has occurred Thus, when consumers are designing for themselves, the effects of self-perceived design skill, as manifested through social anxiety, are likely to be less robust

Taken together, consumers who feel that they do not possess the appropriate skills to design a product are likely to experience greater anxiety in a customization task, particularly when designing for others in the absence of design support More formally,

H_2 Consumers' self-perceived design skill moderates the effects predicted in H_1 When a product is designed as a gift, the lower the consumer's self-perceived design skill, the greater is the influence of design support on anxiety

The Effect of Anxiety on Product Expectations and Satisfaction

What is the relationship between the anxiety experienced during the design task and product expectations? Recent research on customization has found that consumers make judgments about the outcome of a customization task based, in part, on their subjective experience during the task (Kramer 2007, Valenzuela, Dhar, and Zettelmeyer 2009) Specifically, Valenzuela, Dhar, and Zettelmeyer (2009) find that the negative emotions that resulted from the customization task decreased consumers' willingness to purchase the customized product Consequently, we expect that the anxiety consumers experience during the customization task will have a negative effect on their expectations about the product they designed Moreover, experienced anxiety is expected to mediate the effects of the intended recipient, design support, and design skill on product expectations

H_3 Anxiety is negatively related to product expectations, mediating the effects of the intended recipient, design support, and self-perceived design skill

While prior research has demonstrated the relationship between the customization experience and preferences for the customized product, we are unaware of any research that goes the additional step of examining the effects of this relationship on actual product satisfaction By capturing satisfaction with the actual customized product, our research is able to assess how the use of emotions (e g , experienced anxiety) when forming product expectations ultimately affects product satisfaction

The expectations formed during the design process are an important factor influencing satisfaction on receipt of the customized product The expectation–disconfirmation framework in the satisfaction literature (e g , Diehl and Poynor 2010, Oliver 1996) suggests that higher expectations can lead to greater negative disconfirmation (e g , "unpleasant surprises") if the actual product does not meet those elevated expectations Such disconfirmation is more likely to occur if design support simply reduces anxiety without any accompanying improvement in actual product outcomes

The Value of the Productive Resources

The giver's knowledge of the recipient's preferences and his or her ability to manifest those in the customized product may not be the only factors influencing the value of the outcome While the giver's intent is usually to please the recipient, personal motivations are often also active when selecting a gift Givers may use the gifting process to create desired impressions (Wooten 2000) and communicate their own identity (Aron et al 1991, Broniarczyk and Ward 2011, Sherry, McGrath, and Levy 1992) Balancing these often-opposing goals makes "the choice of the right gift more complex than choosing something for oneself" (Broniarczyk and Ward 2011, p 165) Because gifts reflect both the giver's perception of the recipient and the giver's self-identity (Belk 1979, Broniarczyk and Ward 2011, Sherry 1983, Vanhamme and De Bont 2008), greater investments of resources in the creation or purchase of a gift have the potential to enhance both the recipient's and the giver's self-identity As such, the giver is likely to value the gift's ability to reflect the value that he or she, as the giver, places on the recipient and their relationship Robben and Verhallen (2004) demonstrate that recipients place a higher value on gifts that they believe required the giver to incur high behavioral costs (e g , the psychic energy/effort expended on identifying or creating an ideal gift and the time and physical energy spent acquiring or creating it) The giver, recognizing this signal value, is likely to incorporate those behavioral costs into the value they place on the gift

A similar argument cannot be made for self-purchases While self-purchases can reinforce self-identity and self-esteem (Mick and DeMoss 1990), they cannot do so by communicating the value that the recipient (and the relationship) holds for the giver Expenditures of time, effort, and physical energy when making purchases for the self can even be viewed as nuisances rather than reflections of one's own self-perceived value As Norton, Mochon, and Ariely (2010) find in an origami-making task, increases in effort alone did not change participants' valuations of their own self-created objects

Taken together, we propose that consumers place a higher value on the behavioral resources (e g , the amount of the time and effort) expended in the creation of a product when it is intended as a gift for another as opposed to oneself

> H_4 When a product is designed as a gift, there is a positive correlation between the effort expended to create it and the willingness to pay for it No such correlation are observed when the product is designed the self

We test these four hypotheses in the following study

Study 1

We selected customized tote bags as the product category for this study on the basis of several important factors researchers' access to the primary target market (college women aged 18–24 years), product affordability, and cooperation from a customization firm Specifically, the firm agreed to provide the bags at cost, program different versions of the website, and batch-ship the orders (enabling us to control delivery) With annual revenues of $200,000, the company specializes exclusively in customized tote bags, allowing Internet customers to select all the features of each bag's design [1] The firm is also an appropriate choice because gifts make up approximately 35%–40% of the tote bags that are purchased through their website

To most closely approximate realistic conditions, female participants were recruited for the study using both advertisements and in-person announcements at or near college sororities and dorms It is not uncommon in studies on gift-giving to use only female respondents (e g , Lowrey, Otnes, and Ruth 2004, Luomala and Laaksonen 1999, Sherry, McGrath, and Levy 1993) because prior research has shown that women carry a disproportionate responsibility for household gift-giving (Fischer and Arnold 1990, Vanhamme and DeBont 2008, Wooten 2000) Furthermore, 97% of the sponsor firm's actual client base is women

Consistent with the study's cover story, the advertisement stated that a firm specializing in customized products was conducting marketing research on campus with members of its target market (college women aged 18–24 years) In exchange for participation, those completing the study would receive a customized product worth approximately $50 Those interested in the study contacted a research assistant, who scheduled the sessions No other incentives were provided Eighty-two women responded to the advertisements and announcements, all of whom fell in the target age range All but one successfully completed the study

Design and Procedure

We manipulated two factors between participants (1) the intended recipient (self vs other) and (2) design support (present vs absent) Self-assessed design skill was measured When participants arrived, they were seated at a computer with dividers to ensure privacy, randomly assigned to one of the four experimental conditions, given a condition-specific instruction packet, and told they would have as much time as they needed to design their bag Participants were also reminded that they would actually receive the bag they designed in four to six weeks at no cost to them Each session contained between two and six participants and lasted an average of 45 minutes All participants' packets contained the same step-by-step instructions explaining how to access the firm's website, create an account, and navigate through the customization process Participants were able to choose the size of their bag, fabric for three different sections of the bag (from a collection of 37 patterns and colors), trim components, closure type, and embroidered personalization (for examples, see Appendix A) After they finished making their choices, participants saved their completed designs using a unique identification code assigned at the beginning of the session, enabling us to match the bags to the participant at delivery Finally, participants completed the remainder of the survey, were thanked for their participation, and were told that they would be contacted when the bags arrived The website does not have the capacity to show consumers a virtual picture of the final bag, rather, consumers must visualize their final design using the pictures of the fabric swatches and options Thus, there is some uncertainty about what the actual bag will look like

Independent Factors

Intended recipient The first page of the instruction packet contained this manipulation Following a brief introduction, participants in the "self" condition were given the following instructions

> You will be designing this bag for your own personal use! You can use it at school, on the weekends or any other time you would like Please take a few minutes to think about and describe how, when, or why you might use this customized tote bag

Participants in the "other" condition were instead given the following instructions

> You will be designing this bag as a gift for someone of your choosing! Take some time and think about who you

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[1] These features include size of the bag, fabric patterns and colors, trim components (e g , ribbons, beads), closure type (e g , zipper, magnetic, snap), and embroidered personalization (e g , monograms, Greek letters)

> would like to design this tote bag for They can use it at school, on the weekends or any other time they would like Please take a few minutes to describe who you plan to give it to, why you are choosing to design it for them, and about how, when, or why they might use this customized tote bag

Following each of these statements, participants wrote down their thoughts on a page of lined paper We used these open-ended responses to ensure that the manipulation was successful

Design support We manipulated design support both in the instruction packet and on the website itself For participants in the "support present" condition, the first page of their instruction packet also contained the following paragraph offering a review by the firm's professional design consultants

> The company has also agreed to make their professional design consultants available to review your tote bag design before it goes into production, *if you choose* After you have finished designing your bag on the website, you can decide whether or not you would like to have a design consultant provide you with feedback on your design *This service is purely optional'* You are under no obligation to use it, but it is available if you would like Just keep this in mind as you're in the process of customizing the tote bag

In addition to professional guidance/advice, this offer provided participants in the "support-present" condition with additional time following the session to think about and potentially change their design Participants in the "support-absent" condition were also given similar opportunities, they were simply not offered access to the professional consultants

The design support manipulation continued during the actual customization process A software firm created two versions of the company's website—one that contained "help" links for each step of the design process and one that did not These help links provided advice to participants about things to think about when combining certain bag attributes into their designs Those assigned to the support-present condition were given the URL connecting them to the site with the help links embedded, those assigned to the support-absent condition received the URL to the other site Aside from the help links, no other differences in the websites existed

Design skill The third independent factor in this study was self-assessed design skill After completing the customization task and the dependent measures, participants reported on four nine-point scales the extent to which they agreed that they were good designers and had the skills necessary to design a good tote bag, that creativity was an important part of their identity, and that their friends would likely select them to design a bag on their behalf The four items loaded on a single factor and were averaged to create a measure of design skill ($M = 6\ 3$, range $1\ 8–9\ 0$, $\alpha = \ 91$) To verify that the manipulated factors did not influence participants' self-assessed design skill, we used analysis of variance (ANOVA) Neither the manipulated factors nor their interaction significantly influenced design skill (overall model $F(3, 78) = \ 56$, not significant [n s])

Dependent Measures at the Time of Design

Following the completion of the customization task, participants reported their expectations of their bag on six nine-point scales Keep in mind that the participants had not seen a picture of the final bag, they had to imagine what it would look like according to the choices they made Participants indicated the extent to which they believed that their bag was well designed, a good product, and one that they (or the recipient of their gift) would enjoy using Furthermore, participants indicated their confidence in the design they created, how certain they were that they would like it, and the degree to which they expected to be satisfied by the bag's design (see Moreau and Herd 2010) All items loaded on a single factor and were averaged to create an overall measure of expectations ($M = 7\ 7$, range $4\ 8$ to $9\ 0$, $\alpha = \ 94$)

Following the expectations measures, participants reported their current level of anxiety On three nine-point scales, participants indicated the extent to which they were feeling frustrated, nervous, and stressed The three items were averaged to create an index of anxiety-related negative emotions ($M = 3\ 6$, range $1\ 0$ to $9\ 0$, $\alpha = \ 78$)[2] Next, on a nine-point scale, participants reported the extent to which they agreed that designing the tote bag required a great deal of effort ($M = 3\ 2$, range $1\ 0$ to $9\ 0$)

Dependent Measures at Delivery

When participants received their bags six weeks later, they completed a brief follow-up survey After taking time to examine their bags, participants reported on their satisfaction and willingness to pay

We assessed satisfaction using a calculated expectation–disconfirmation measure (Diehl and Poynor 2010, Oliver 1977) To keep the questionnaire brief, we used three items to assess participants' reactions to their completed bags After they received their bags, participants indicated how attractive and well-designed their bag was and the extent to which they were proud of the design The items loaded on a single factor, and we averaged them to form an evaluation index ($M = 7\ 0$, range $3\ 0$ to $9\ 0$, $\alpha = \ 93$) We computed satisfaction by subtracting expectations at the time of design from evaluations at the time of delivery ($M = -\ 7$, range $-5\ 5$ to $4\ 2$, Diehl and Poynor 2010, Oliver 1977) Participants then responded to the following open-ended question "If you had been asked to buy this tote with your own money, how much would you have been willing to pay for it?" (M = $26 45, range $10 00 to $55 00)

Results

At the Time of Design

Manipulation check Two research assistants reviewed participants' open-ended thoughts, they confirmed that the "intended recipient" manipulation was effective Participants in the "other" condition identified a gift recipient for their bags

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[2] Three items capturing positive emotions were also measured (happy, excited, and enthusiastic) Overall, participants reported a high level of positive emotions ($M = 7\ 8$ on a nine-point scale) Because neither the manipulated nor measured variables significantly influenced positive emotions, we do not discuss them further

Anxiety Following Irwin and McClelland (2003), we treated design skill as a continuous measure and used regression to test the effects of the independent variables on participants' anxiety at the time of design The regression revealed both an interaction between the intended recipient and design support (β = –1 67, t = –2 34, $p <$ 05) and a three-way interaction among those two factors and design skill (β = 24, t = 2 24, $p <$ 05)

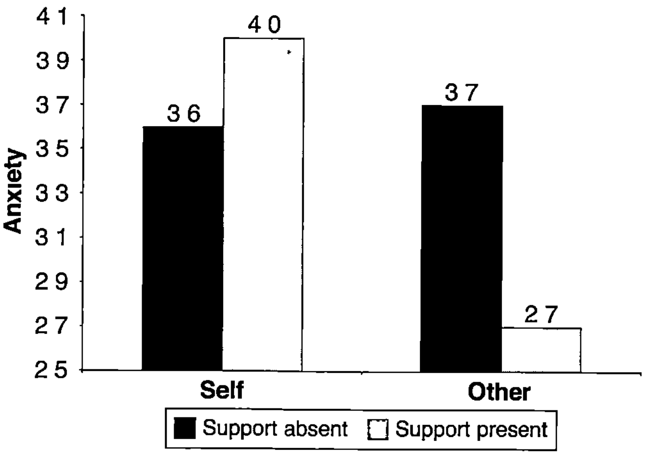
We used an ANOVA to interpret the two-way interaction and to test H_1 Consistent with H_{1a}, when the tote bag was intended as a gift, design support significantly reduced participants' anxiety ($M_{\text{Other, Support Present}}$ = 2 7 vs $M_{\text{Other, Support Absent}}$ = 3 7, contrast F(1, 41) = 4 69, $p <$ 05) When the bag was intended for the participant herself, however, the effect of design support was attenuated ($M_{\text{Self, Support Present}}$ = 3 6 vs $M_{\text{Self, Support Absent}}$ = 4 0, F(1, 38) = 48, n s), as H_{1b} predicted Design support clearly reduced the anxiety of those designing for others but did not have a similar effect on those designing for themselves (see Figure 2, Panel A)

We used a spotlight analysis to interpret the three-way interaction, with the results shown in Figure 3 We ran separate regressions for the self and other conditions with design support, design skill, and their interaction as predictors of anxiety When participants were designing the bags for themselves, there were no significant effects of the predictors on anxiety (see Figure 3, Panel A) When participants were designing the bags for someone else, however, the results revealed the main effect of design support described previously (β = –2 47, t = –2 82, $p <$ 01) as well as an interaction between design support and design skill (β = 08, t = 2 38, $p <$ 05, see Figure 3, Panel B) When design support was present, the relationship between design skill and anxiety was significant (β = 11, t = 2 39, $p <$ 05) Consistent with H_2, design support was most effective in reducing the anxiety of those with lower reported design skill

Notably, participants who designed the bags for themselves still reported a moderate level of anxiety As we noted previously, consumers are not always fully aware of

FIGURE 2
The Interaction Between Design Support and the Intended Recipient (Study 1)

A· Anxiety



B Product Expectations

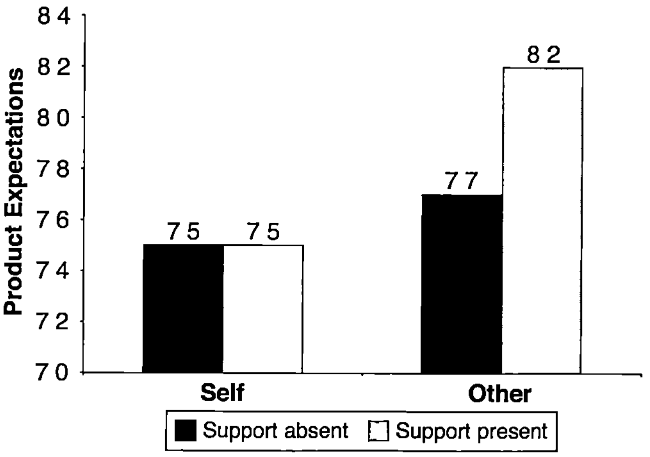
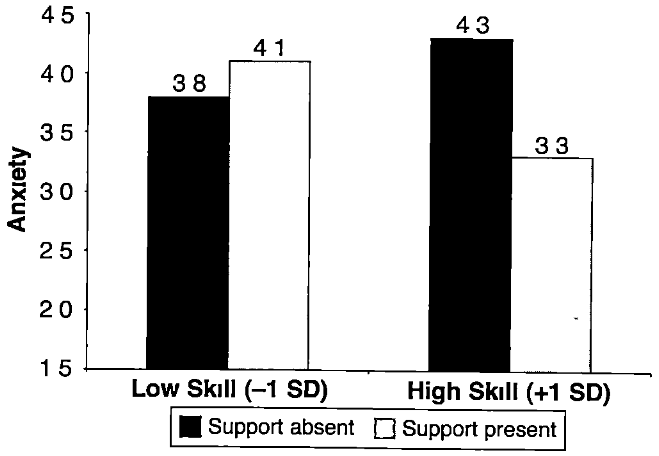
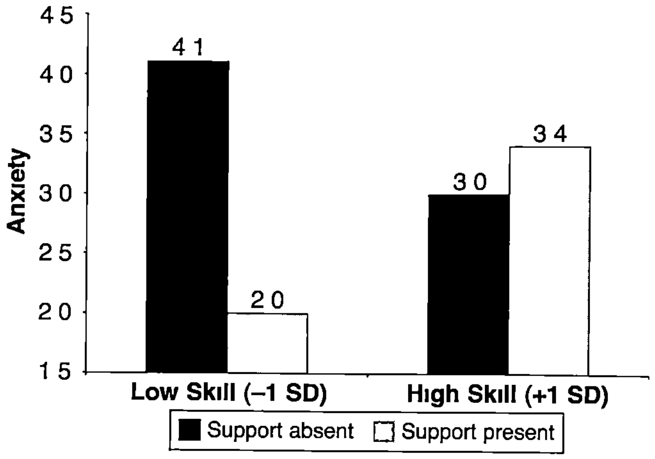


FIGURE 3
Anxiety (Study 1)

A. Self



B: Other



their own preferences, and for these consumers, customizing products can result in frustration or anxiety. Our findings suggest that the design support offered in this study alleviates the type of anxiety arising from a combination of a gifting context and a perceived lack of ability. The support, however, did little to lessen anxiety in participants customizing for themselves.

Product expectations. We also used regression to test the effects of the independent variables on participants' expectations of their bags at the time of design. As with anxiety, the results revealed a significant interaction between the intended recipient and design support ($\beta = 1.09$, $t = 2.84$, $p < .01$). We also observed a significant three-way interaction among the intended recipient, design support, and design skill ($\beta = -.16$, $t = -2.67$, $p < .01$).

We used an ANOVA to interpret the two-way interaction (see Figure 2, Panel B). When the bag was intended as a gift, the presence of design support significantly increased participants' expectations ($M_{\text{Other, Support Present}} = 8.2$ vs. $M_{\text{Other, Support Absent}} = 7.7$, contrast $F(1, 41) = 4.06$, $p < .05$). However, when the bag was intended for the participant herself, design support had no influence on expectations ($M_{\text{Self, Support Present}} = 7.5$ vs. $M_{\text{Self, Support Absent}} = 7.5$, $F(1, 38) = .75$, n.s.).

To facilitate interpretation of the three-way interaction, we again used a spotlight analysis at one standard deviation below and above the mean of design skill (Fitzsimons 2008). Figure 4 highlights the results. We ran separate regressions for the self and other conditions, with design support, design skill, and their interaction as predictors of product expectations. As with anxiety, when the product was intended for the self, the predictors had no significant effects on expectations (see Figure 4, Panel A). However, when the bags were intended as gifts, the results reveal the significant main effect of design support described previously ($\beta = 1.24$, $t = 2.47$, $p < .05$), a positive main effect of design skill ($\beta = .04$, $t = 2.07$, $p < .05$), as well as a significant interaction between the two ($\beta = -.04$, $t = -2.18$, $p < .05$; see Figure 4, Panel B). The negative valence of the interaction's coefficient suggests that the positive effects of design support diminish at higher levels of self-reported design skill.

Does the anxiety experienced during the design process more generally explain participants' expectations of their bags, as H_3 predicts? To answer this question, we added anxiety to the regression model predicting expectations and found the significant, negative effect H_3 predicts ($\beta = -.24$, $t = -4.26$, $p < .01$). With its addition, both the two-way interaction ($\beta = .68$, $t = 1.92$, $p > .05$, Sobel = 2.06, $p < .05$) and the three-way interaction fell below significance ($\beta = -.10$, $t = -1.79$, $p > .05$, Sobel = –1.98, $p < .05$). Anxiety mediated the effects of the intended recipient, design support, and design skill on participants' product expectations.

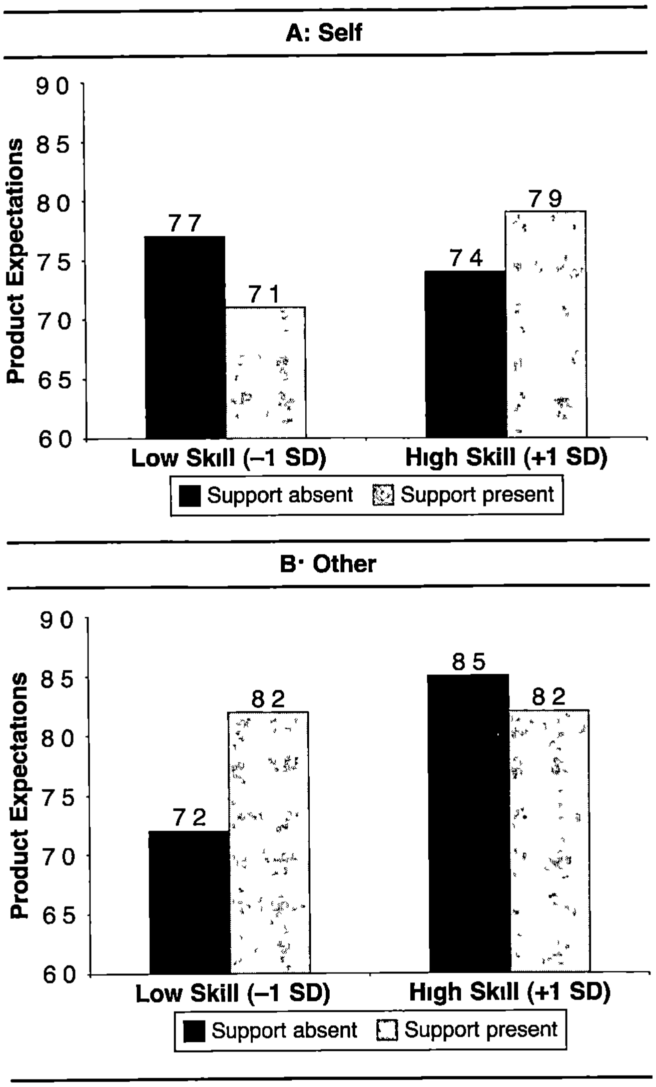
At the Time of Delivery

The bags arrived approximately six weeks following the completion of the study (for examples, see Appendix B). Participants were informed of their arrival and given the opportunity to schedule a pickup time. Of the 81 participants, 74 picked up their bags and completed the final survey. There was no significant effect of the independent factors on participants' pickup behavior.

Satisfaction. With this computed measure, higher positive values indicate positive disconfirmation (e.g., "pleasant surprises"), and negative values indicate negative disconfirmation. A value of zero suggests that participants' expectations were perfectly matched by the actual bag. Recall that the effects of the independent factors on product expectations were mediated by the anxiety experienced during the customization task. Are these emotions experienced during the design process a good predictor of overall satisfaction? We use a regression to address this question, examining the influence of the independent factors on disconfirmation to assess whether design support, in addition to decreasing anxiety for some consumers, actually improved design outcomes.

The results reveal a significant two-way interaction between the intended recipient and design support ($\beta = -1.51$, $t = -2.03$, $p < .05$). When the tote bag was intended as a gift, the presence of design support significantly

FIGURE 4
Product Expectations (Study 1)


A: Self

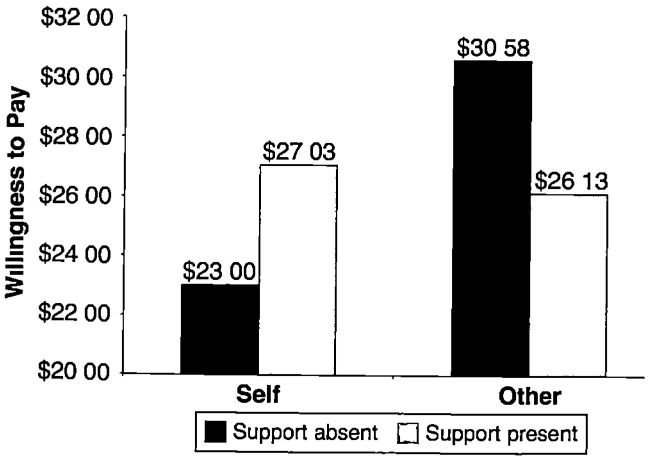
B: Other

increased participants' negative disconfirmation ($M_{\text{Other, Support Present}}$ = –1 4 vs $M_{\text{Other, Support Absent}}$ = – 3, F(1, 37) = 3 67, p = 05) However, when the bag was intended for the participant herself, design support had no significant influence on disconfirmation ($M_{\text{Self, Support Present}}$ = – 6 vs $M_{\text{Self, Support Absent}}$ = – 4) Together these findings suggest that design support acted more as a placebo during the design process, reducing anxiety for those designing gifts without actually increasing the quality of the outcomes

Willingness to pay We used a regression to determine the effects of the independent variables on willingness to pay Both a main effect of the intended recipient (β = 7 76, t = 2 08, p < 05) and an interaction between the intended recipient and design support emerged (β = –7 79, t = –2 09, p < 05) Participants were willing to pay more for a bag designed for someone else rather than for themselves (M_{Other} = \$28 11 vs M_{Self} = \$25 52) This main effect was qualified by an interaction The presence of design support had a marginally significant, positive influence on participants' willingness to pay when the bag was for themselves ($M_{\text{Self, Support Present}}$ = \$27 03 vs $M_{\text{Self, Support Absent}}$ = \$23 00, F(1, 35) = 2 85, p < 10) but a significant, negative influence when the bag was for someone else ($M_{\text{Other, Support Present}}$ = \$26 13 vs $M_{\text{Other, Support Absent}}$ = \$30 58, F(1, 37) = 3 83, p < 05, see Figure 5)

Could satisfaction explain participants' willingness to pay? To test this relationship, we added satisfaction to the regression model predicting willingness to pay and found that it had a significant effect (β = 1 54, t = 2 60, p = 01) With this addition, the two-way interaction fell below significance (β = –5 78, t = –1 53, p > 10, Sobel = –1 87, p = 06), yet the main effect of the intended recipient remained significant (β = 8 38, t = 2 81, p < 05) Thus, satisfaction appears to explain why those who designed gifts with design support available were willing to pay less for their products than those who designed gifts without design support Satisfaction, however, cannot account for why participants were generally willing to pay more when the bags were intended as gifts rather than for themselves

FIGURE 5
Willingness to Pay (Study 1)



To explain this main effect, we test whether participants were differentially valuing their productive resources (e g , time and effort) according to the intended recipient, as proposed by H_4 We determined the correlation between self-reported effort and willingness to pay separately for those in the self and other conditions[3] Keep in mind that effort was reported at the time of design while willingness to pay was reported six weeks later at delivery Consistent with H_4, there was a positive, significant correlation between effort and willingness to pay for those designing the product as a gift (r = 41, p < 05) For those designing the bag for themselves, however, the correlation was not significant (r = – 13, p > 10) As Figure 1 highlights, our findings suggest that there are two mechanisms that influence willingness to pay for the customized product (1) the consumer's satisfaction with the product and (2) the extent to which the consumer valued her own design effort

Discussion

The findings from this study demonstrate two ways the intended recipient influenced the value consumers place on their customized products (see Figure 1) First, design support, together with self-perceived design skill, decreased anxiety and raised product expectations when participants were designing products as gifts but not for themselves Because these expectations were not met, those designing gifts with design support reported greater negative disconfirmation and lower willingness to pay than those givers without support

Second, the findings show that the intended recipient influenced how participants valued the effort they expended during the design process One of the most intriguing findings from Study 1 was the premium participants were willing to pay for product when it was intended as a gift (\$28 11) rather than for oneself (\$25 52) While actual productive resources (e g , money, time, effort, Wooten 2000, p 93) were constant across conditions in this study,[4] consumers placed a higher value on their effort when designing a gift In all likelihood, these behavioral resources were valued to a greater extent in a gifting context because of their ability to signal the importance and meaningfulness of the recipient and the relationship As Belk (1996, p 61) notes, a perfect gift is one that the giver made a sacrifice to provide Our results indicate that givers place a value on their sacrifices In Study 2, we examine whether the presence of a strong brand moderates the value consumers place on their behavioral resources when designing a gift for someone else

The Role of Branding

In a gift-giving context, brand names can be used to signal the resources that were devoted to acquisition or creation of a gift Strong brands command a premium in the marketplace because they both signal and provide quality and consistency to the consumer (Aaker 1996) Brands essentially indicate the amount of productive resources that the firm devoted to the design and manufacturing of the product A unique aspect of a customization setting, however, is that consumers and producers share in the design, but not in the manufacturing, of the product For example, the functional aspects of the shoes sold through the NIKEiD customization site are fully controlled by Nike, however, the aesthetic aspects of the shoes are primarily under the control of the consumer Does this "sharing" of the production process influence the brand's effectiveness? We argue that the answer to that question depends on the intended recipient

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[3] Neither the independent factors nor their interactions had any significant effects on reported effort

[4] The independent variables had no significant independent or interactive effects on time, self-reported effort, or the actual cost of the bags in Study 1

When the customized product is intended for the self, the consumer benefits both from the high-quality functional performance promised by the brand and the design's close match to his or her own unique preferences Thus, a customized product carrying a strong brand name is likely to be valued more highly than a comparable unbranded customized product because the brand still signals the significant resources devoted to the manufacturing process

We might expect a similar effect when the customized product is intended for someone else The giver may place a premium on a branded customized product because the brand is able to signal to the recipient the resources invested in the product by both the giver and the manufacturer However, the act of designing a customized product requires behavioral resources not required when buying a product "off the rack " We have shown that behavioral resources are more highly valued when the product is intended as a gift rather than for oneself Key to this value, however, is the giver's belief that the recipient will recognize the giver's efforts A strong brand placed on a customized product may obfuscate this attribution Specifically, the giver may be concerned that the brand name, not the giver, will get credit for the behavioral resources expended in designing the product Though the giver "designed it him- or herself," the recipient may be unaware of the giver's efforts Thus, givers may not value their behavioral resources (i e , effort) as much when a strong brand is present Evidence for this process would be found by comparing the correlations between the giver's effort and willingness to pay in a branded versus unbranded context We predict that the correlation will be lower when givers are customizing a branded rather than an unbranded product More formally,

> H_5 When a product is designed as a gift, the positive correlation between effort and willingness to pay is attenuated when a strong brand is present

How will these effects influence consumers' willingness to pay for their customized products? When no brand is present, the results from Study 1 should replicate because participants value their own efforts to a greater extent when the product is intended as a gift rather than for themselves For these participants, there is no brand to establish strong price or quality expectations Thus, we predict higher willingness to pay when the bags are intended as gifts rather than for the consumer

When a strong brand is present, however, such price and quality expectations do exist, regardless of the intended recipient Furthermore, we expect the correlation between effort and willingness to pay to be less pronounced, for those designing both for themselves and for others Consequently, the intended recipient is less likely to influence participants' willingness to pay for the branded product We test these predictions in the following study using a more objective measure of behavioral resources (actual time)

Study 2

Design and Procedure

The same firm that partnered with us in Study 1 agreed to assist us with Study 2 to better understand the role of branding In Study 1, we used the sponsor company's active website as the context for the study However, the sponsor firm is a start-up company with relatively small revenues and, more important, low brand recognition in the target market Therefore, in Study 2, two new websites were created One incorporated a highly recognized brand name on all the pages, the other was entirely generic, with no brand presence whatsoever The firm agreed to work with its programmers to create these two dummy websites These sites were identical in all ways except one was branded as a well-known handbag producer (Vera Bradley) while the other had no brand identity at all The dummy sites worked exactly as the live site, but only participants in the study had access to the URLs The potential for copyright infringement also prohibited us from producing bags for the participants in this study Participants designed their bags online in the same way they had in Study 1

In this study, no one received design support, and participants did not expect to actually receive the bag they had designed To better approximate a real-world setting, we administered this study using online survey software, with participants completing the study when and where they chose (within a 48-hour window) Not only did this approach provide more realistic conditions, it also allowed us to measure the time participants spent on the task

Participants were 76 women at a large southeastern university who took part in the study in exchange for course credit Both the intended recipient (self vs other) and brand (present vs absent) were manipulated between subjects in this 2 × 2 study Because we used a known brand in the study, we used participants' attitude toward that brand as a covariate along with participants' self-reported design skill

Independent Factors

Intended recipient Intended recipient (self vs other) was manipulated in the exact same manner as in Study 1 The survey software contained the same instruction sheet given to participants in the "design-support-absent" conditions in Study 1 As in Study 1, the first page contained the "intended-recipient" manipulation followed by the same open-ended questions After completing the open-ended section, participants designing for someone else also answered one additional question Participants in the "other" condition indicated on a nine-point scale how close their relationship was with the intended recipient Participants in the "self" condition were not presented with this question

Brand Two dummy versions of the customization website were created for this study, one branded and one not

Both sites performed exactly the same way as the live site used in Study 1, however, to avoid copyright issues, the sites were actually dummy sites that only the participants could access The branded website incorporated the logo and name of a popular, high-end handbag company (Vera Bradley) on all pages of the site Participants were also led to believe that the bags produced would carry the Vera Bradley label [5]

To select this brand, we conducted a pretest with 100 female students at the same university where the study took place In the pretest, respondents reported the top five brands that first came to mind when asked to think of high quality handbags Vera Bradley appeared as either the first or second brand in 72% of the responses and appeared as one of the top five brands in 88% of the responses At the time of the study, this particular name brand did not offer cocreated products The cover story given for the branded site was that Vera Bradley was researching a new cocreated product line The generic version of the site was created by removing all references to any particular company

Dependent Measures

Willingness to pay As in Study 1, participants responded to the following open-ended question "If you had been asked to buy this tote with your own money, how much would you have been willing to pay for it?" (M = $35 96, range $0 to $80 00) Unlike Study 1, participants provided this information without having seen (or received) the actual handbag

Time The survey software captured the time participants spent completing the full study Although it does not indicate how much time they spent on the design task itself, it does serve as an approximation of the amount of time spent on the task Because participants could complete this study at the time and place of their choosing (within a 48-hour window), the time spent had much greater variance than that observed in Study 1, in which the sessions were scheduled in the on-campus computer lab (M = 29 9 minutes, range 13 0 to 101 0) Time is a measured productive resource indicative of effort, and we use its correlation with willingness to pay to test H_4 and H_5

Covariates

Design skill Because design skill had a significant influence on expectations in the first study, we included it as a covariate in the analyses We measured skill using the same items as in Study 1 at the end of the survey As in the first study, the manipulated factors had no significant effect on participants' self-assessed design skill (M = 4 5, range 1 0 to 7 0, α = 89) [6]

Brand attitude All participants indicated their attitude toward the Vera Bradley brand Only 3 of the 76 participants were unfamiliar with the name Participants familiar with the brand indicated their agreement with the following four statements (1) "I will not buy other brands if a Vera Bradley bag is available at the store," (2) "Vera Bradley would be my first choice when shopping for a new bag," (3) "I consider myself to be loyal to Vera Bradley," and (4) "I am willing to pay a higher price for a Vera Bradley bag than I would for other brands" (M = 3 2, range 1 0 to 7 0, α = 92) Neither of the manipulated factors significantly influenced this measure

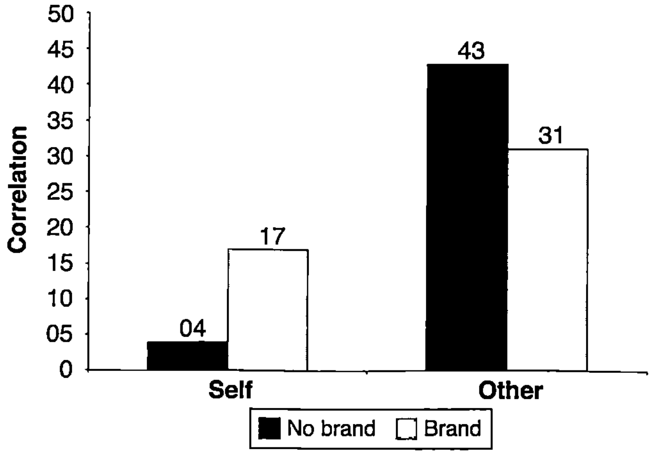
Results

Manipulation checks Two research assistants reviewed participants' open-ended thoughts regarding the intended bag recipient (self or other), they confirmed that the "intended recipient" manipulation was effective All those in the "other" condition identified a gift recipient for their bags Importantly, those in the "other" condition reported having close relationships with those for whom they were designing the bags (M = 8 4, range 2 0 to 9 0)

The correlation between time and willingness to pay H_4 predicts that a positive correlation will exist between the time participants spent customizing the product and their willingness to pay for it when designing the product as a gift but not for themselves H_5 then predicts that the presence of a strong brand will moderate this effect Specifically, H_5 predicts that the positive correlation will be stronger when participants are designing a gift on an unbranded (vs a branded) website As in Study 1, we expect no correlation between time and willingness to pay when participants design a product for themselves, regardless of whether a strong brand is present

To test H_4, we calculated correlations separately for the self and other conditions As we predicted, the correlation between time and willingness to pay was positive and significant when participants designed for someone else (r = 34, $p <$ 05) but not when they designed for themselves (r = 02, n s) To test H_5, we calculated correlations between time and willingness to pay within each of the four conditions The results appear in Figure 6 and are consistent with

FIGURE 6
Correlation Between Time and Willingness to Pay (Study 2)



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[5] Participants were later debriefed on the study and informed that Vera Bradley's involvement was hypothetical

[6] Design skill did not interact with either of the independent factors manipulated in this study

H_5 The only correlation that was both positive and significant was observed in the unbranded gift condition (r = 43, p < 05) The correlation in the branded gift condition was smaller in magnitude and nonsignificant (r = 31, p = 20), and those in both of the self conditions were also nonsignificant (r = 04 and r = 17, n s)

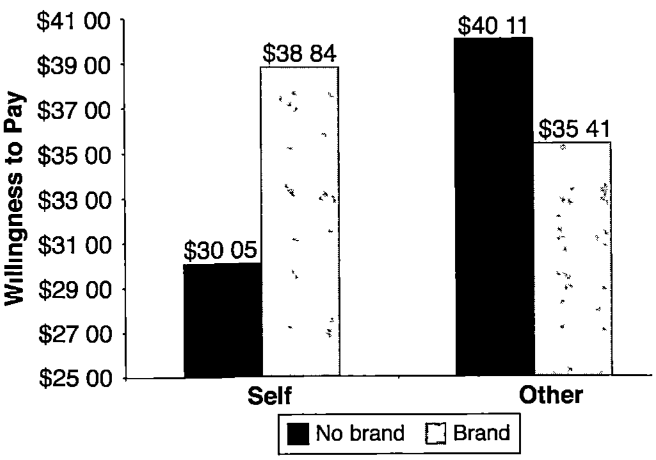
Willingness to pay We used a two-way ANOVA to assess the influence of the independent factors on willingness to pay, we also included the two covariates as predictors As expected, the results revealed a significant interaction between brand and the intended recipient (F(1, 75) = 4 33, p < 05) When no brand was present, the intended recipient had a significant effect on willingness to pay ($M_{\text{Self, No Brand}}$ = $30 05 vs $M_{\text{Other, No Brand}}$ = $40 11, F(1, 37) = 4 83, p < 05) However, when the strong brand was present, no significant effects were observed ($M_{\text{Self, Brand}}$ = $38 84 vs $M_{\text{Other, Brand}}$ = $35 41, F(1, 35) = 82, n s , see Figure 7) Importantly, when participants designed for themselves, the brand still had a positive effect on willingness to pay ($M_{\text{Self, No Brand}}$ = $30 05 vs $M_{\text{Self, Brand}}$ = $38 84, F(1, 36) = 3 75, p = 05)

The results from this study demonstrate that firms' use of brand names on their customization websites can reduce the effects of the intended recipient on consumers' willingness to pay for their products Furthermore, this study shows that when consumers design for themselves, the brand still commands a premium There is good news, however, for firms lacking a strong brand name These firms can benefit from the higher valuation consumers place on their productive resources (e g , time and effort) when designing products as gifts

General Discussion

While interpersonal giving has received considerable attention in the marketing literature (e g , Belk 1979, Fischer and Arnold 1990, Lowrey, Otnes, and Ruth 2004, Sherry 1983, Vanhamme and De Bont 2008, Wooten 2000), little attention has been paid to direct comparisons between gift-purchasing and self-purchasing occasions Our research does exactly that in a customization context and shows that firms may benefit from tailoring the customization experience to the purpose of the consumer's visit (gift purchase versus self purchase)

FIGURE 7
Willingness to Pay (Study 2)



Managerial Implications

Randall, Terwiesch, and Ulrich (2005, p 71) highlight the irony that many firms "that are at the forefront of the customization movement offer a single *standard* process for their customization experience " Because our findings ultimately show that willingness to pay depends on the intended product recipient (self vs other), managers could ask consumers at the outset of the design process whether the product is intended as a gift The entire customization experience could then be customized accordingly

Expectations In Study 1, design support was more effective in decreasing anxiety when consumers designed the custom product as a gift rather than for themselves Lower anxiety levels then translated into higher expectations at the time of design These inflated expectations, however, were not met six weeks later at delivery, and willingness to pay suffered These findings lead to the conclusion that unless design support can actually improve design quality to meet expectations, design support may be less effective

Rather than simply removing design support for those designing gifts, a more effective strategy for addressing this potential problem would be to better manage the giver's satisfaction after the design process is complete Specifically, firms could send messages to givers during the time when the product is being manufactured that congratulate the giver on her design, reassure her that quality control has reviewed the product, and inform her that the firm's experts are confident that her product will be well received Given the importance of social anxiety in the gifting context, the firm could also provide a quality guarantee that offers to allow the recipient to design a replacement product at no cost if the recipient is not completely satisfied with the custom product This option would allow the giver to save face in the gifting situation and ensure that the recipient's exact needs and wants are met

Perceived effort Both studies found support for the idea that higher levels of effort, whether real or perceived, increased willingness to pay when the product was being customized as a gift This finding suggests that the investments consumers make in navigating the potentially complex customization process are reflected in a higher value placed on the end product, but only when it is designed as a gift Thus, firms may want to subtly emphasize the time, effort, and psychic energy that the consumer is investing when it is intended as a gift To do this, a firm must be careful not to draw attention to the consumer's frustration but rather to the decisions that she is making on behalf of the recipient One way to accomplish this would be to customize the website for givers, making the name of the recipient salient at each decision point For example, when the giver first begins the customization process, she could provide the name of the intended recipient For each decision she then makes, the website could use the recipient's name (e g , "please choose the fabric that Susan would like on the front of her bag")

Another important way to leverage this finding would be to provide givers with a tasteful way to convey their efforts to the recipient Firms could include custom labels in or on the customized product, noting that the product was designed by the giver specifically with the recipient in mind (e g , "Designed by Jane especially for Susan on her 21st Birthday") The custom label would reassure the giver that the recipient will be aware of her efforts, while the prompts on the website would remind the giver of the effort she is putting into the product on behalf of the recipient

Branding Study 2 demonstrates that branded products can still extract a premium from consumers who are designing for themselves Self-designers who design a branded product enjoy the promise of quality offered by the brand in conjunction with a customized product optimized to their own unique preferences This finding should be reassuring to firms engaged in or considering customization offerings because it implies that existing brand equity can be leveraged and further developed in the marketplace For the designers of gifts, a strong brand may still be able to command a premium if the giver does not feel she is competing with the brand for credit By employing tactics such as the use of the customized "Designed By " labels, the firm may enable givers to value their own efforts to the same extent that they do on unbranded products, knowing that they will get the credit for the design

Theoretical Contributions

To our knowledge, our research is the first to examine the influence that the intended recipient has on a customized product's evaluation By undertaking such a study within a customization setting, we are able to make theoretical contributions to the gift-giving literature Because customization involves effort on the part of the designer, we are able to examine how that effort contributes to consumers' product reactions Using two different measures of effort (subjective in Study 1, objective in Study 2), we demonstrate that consumers place a higher value on the behavioral costs that they expend in the design of a customized product when it is intended as a gift rather than for personal use This higher valuation likely reflects the value that the giver places on the recipient (and the relationship) while simultaneously enhancing the giver's self-identity Further research will be necessary to generalize this finding to noncustomization settings

We contribute to the growing literature on customization by demonstrating that the premium consumers are willing to pay for these unique products depends on whether consumers are shopping for themselves or for others Specifically, our results show that the effectiveness of the firm's investments in design support and branding strategies in increasing consumers' willingness to pay depends on the intended recipient To our knowledge, Study 2 is the first to manipulate the presence of a strong brand to understand its influence in a customization context Our findings demonstrate that brands can still command a premium in these customization settings, firms lacking a strong brand presence, however, can achieve a similar premium when consumers value their own design efforts, as observed in a gifting context Further research on customization should consider whether more specific aspects of the brand (e g , personality and awareness) are differentially effective depending on the recipient

Limitations and Further Research

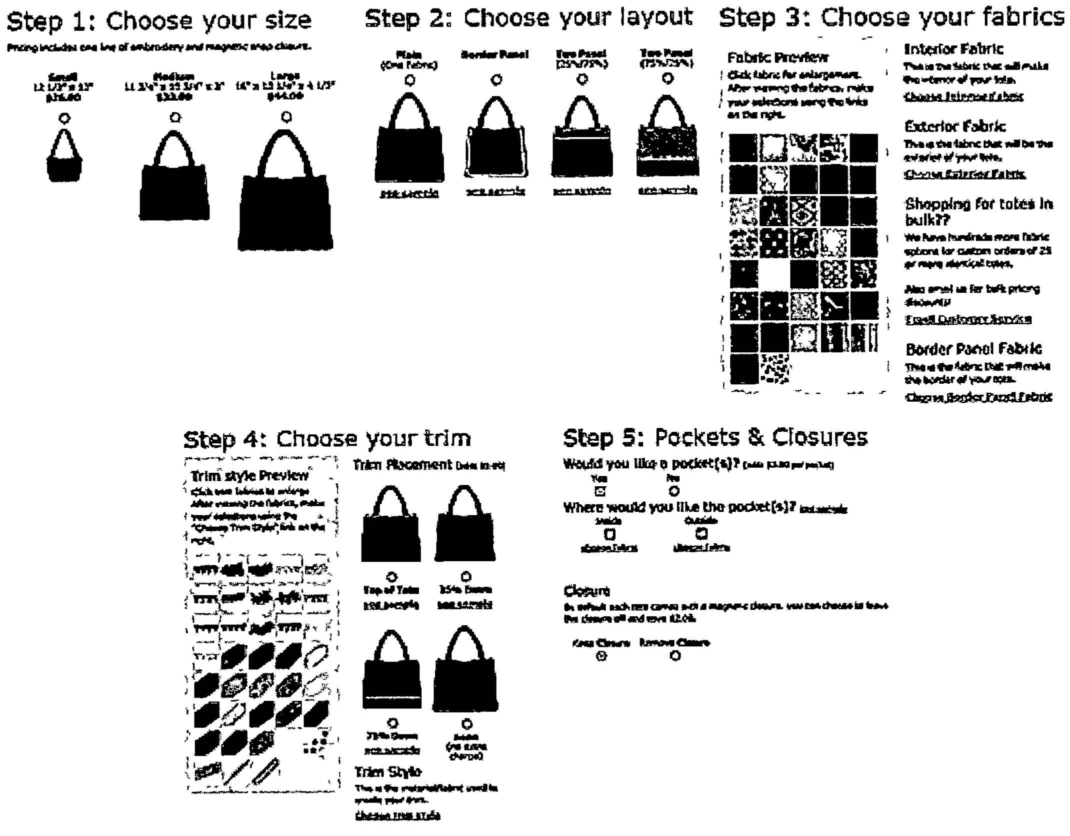
Inherent in any study are limitations and opportunities for further research that should be acknowledged One shortcoming of the first study was that we only measured willingness to pay at the time of delivery and not immediately following the design process We made this decision, in part, due to the capabilities of the website Because the site could not show a simulated picture of the finished product, we felt that willingness to pay would be more informative when participants received their actual products

Second, the design support provided in Study 1 produced a placebo effect, reducing gift-givers' anxiety without a commensurate improvement in the actual outcome It is possible, however, that a different type of design support would be more effective in improving the actual outcome Thus, further research should investigate whether different types of design support may reduce anxiety *and* improve the product's actual designs in the eyes of the customer

A third limitation of this work is that the generalizability of the results is limited because of the composition of the sample and the choice of the stimuli While female college students were an appropriate and realistic sample to use in the context of handbag customization, the application of the results to other cocreation media that serve broader segments should be done with caution Future work on gifting and cocreation should extend to other product areas, should examine the effects of brands that vary in strength, and should include broader and more diverse samples Further research should also examine customization decisions that extend beyond the purely aesthetic realm Important differences may emerge When customizing the functional aspects of products, for example, novice consumers may experience high levels of uncertainty regardless of the intended recipient Extending this work into the functional domain would also allow for greater generalizability of our findings

Finally, a central tenet of both studies is that relative effort is an important determinant of product outcomes (satisfaction and the prices that participants were willing to pay), especially when the customer is designing for someone else However, neither of our studies compared designing products to simply selecting products from a standardized set While it is important to note that designing and selecting are two different phenomena, future studies should investigate whether similar results would be found if customers were given such a choice

APPENDIX A
Examples of the Choices Participants Made in the Customization Task



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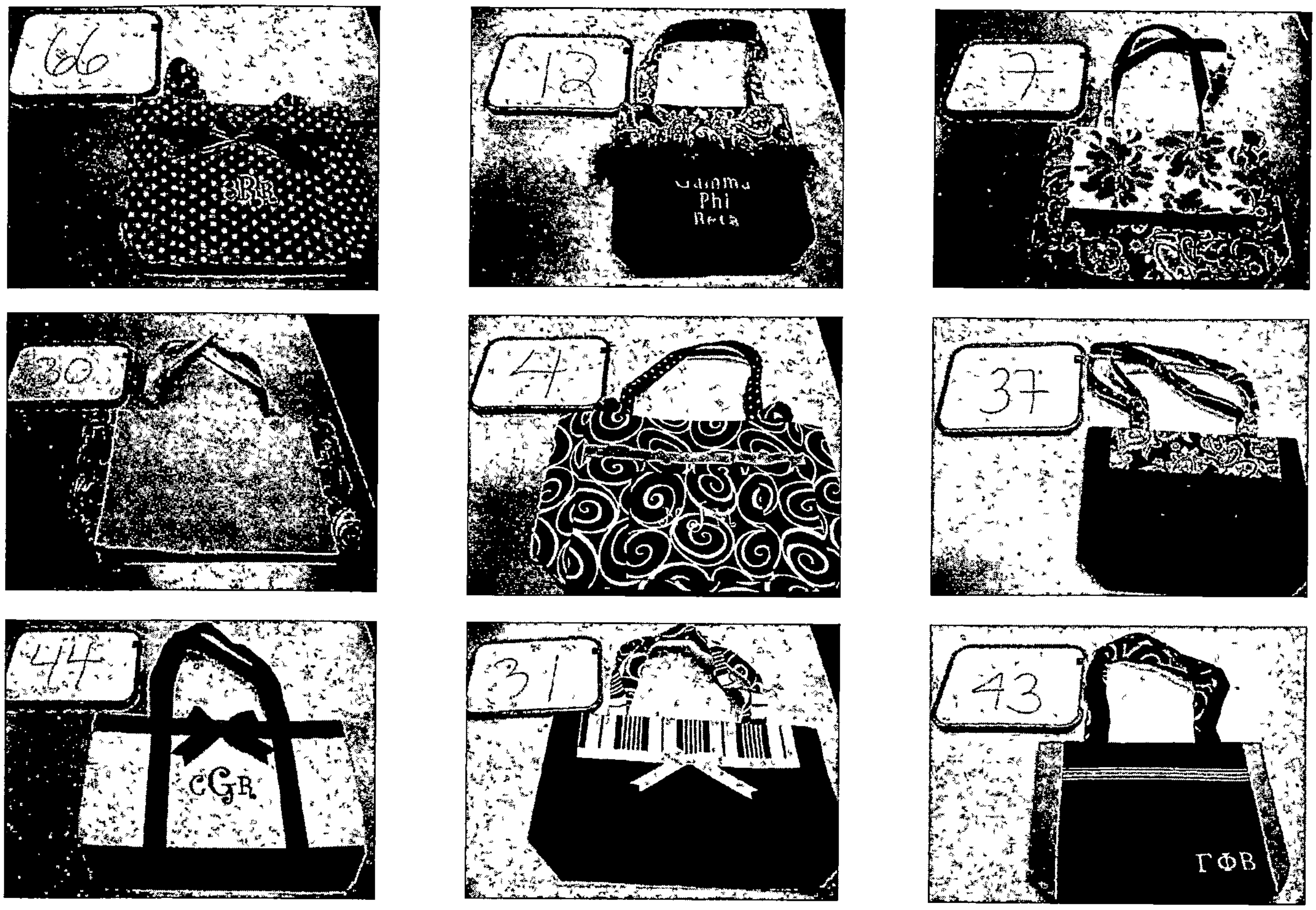
APPENDIX B
Design Examples



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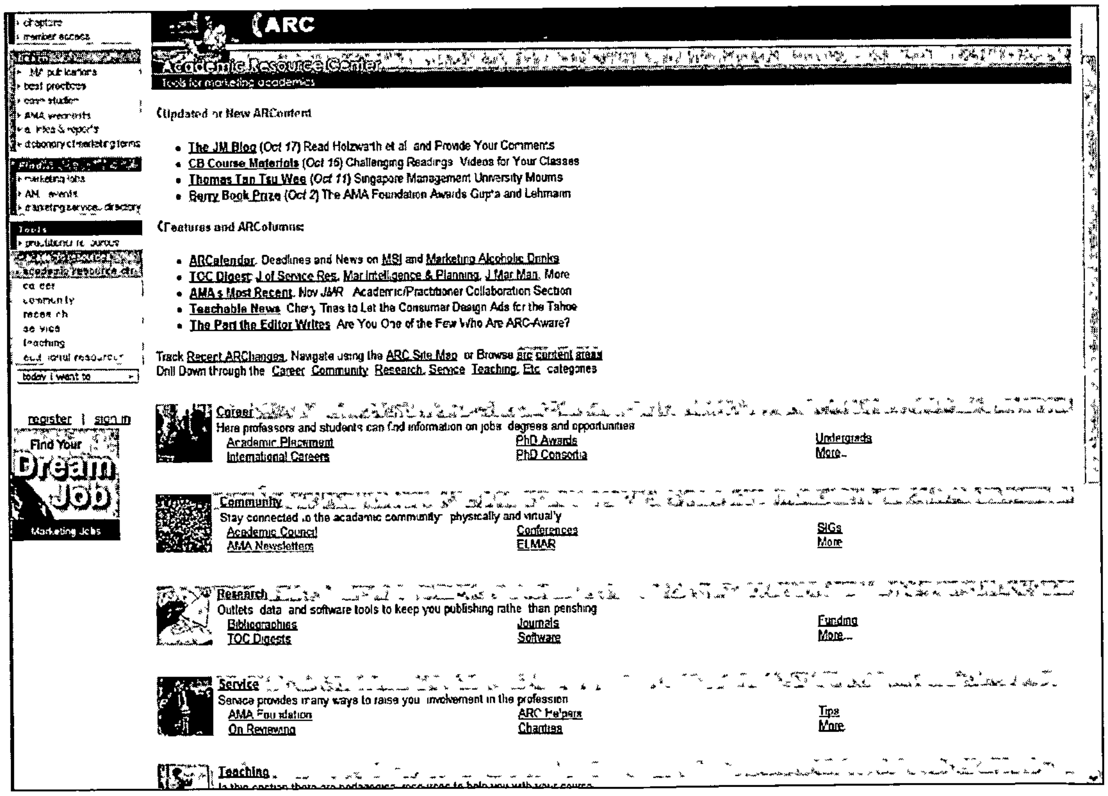

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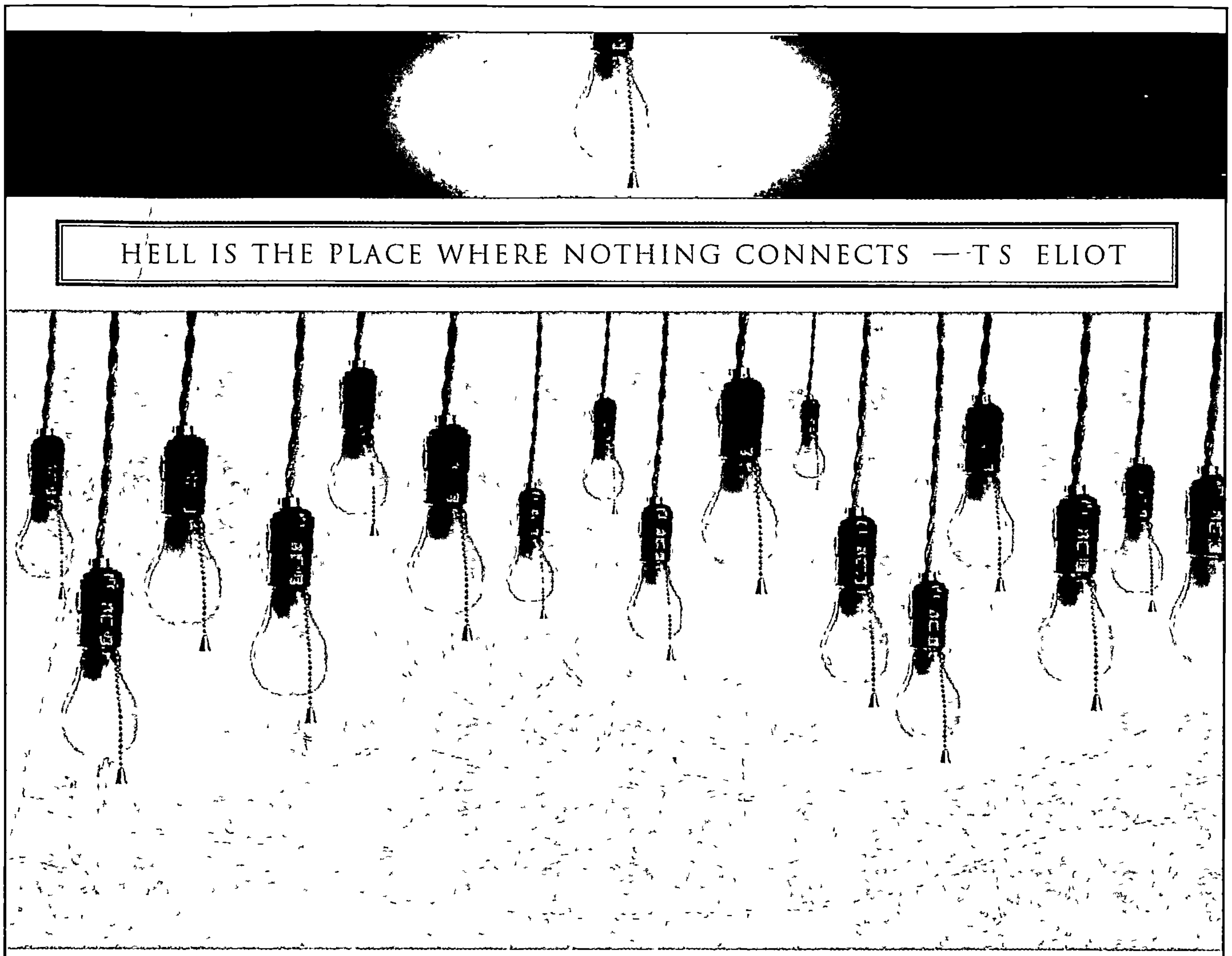

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Internationalization During Times of Changing Markets

Journal of International Marketing

Internationalization is a process of firm expansion into new markets Although a great deal of work has been engaged to enhance understanding of firm internationalization, the importance of marketing and marketing-related topics is often overlooked, thus leaving international marketing scholars and practitioners with an incomplete understanding of the marketing side of this important issue As such, the purpose of this special issue is to focus attention on the importance of marketing and marketing-related topics associated with internationalization and its process It is hoped that through this special issue, greater theoretical and methodological understanding can be gained pertaining to the marketing aspects of internationalization

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- Internationalization's relationship with sustainability
- Corporate social responsibility during internationalization
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- Forward and backward internationalization Entering and leaving markets
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University of California, Riverside

Outstanding Reviewers

Among all the outstanding Editorial Review Board members, five people stood out as having more reviews than average, completing them faster than average, and having the highest level of quality They are the winners of the ***Best Reviewer Award*** for 2010–2011

Joe Alba (University of Florida)
Leigh McAlister (University of Texas at Austin)
Rik Pieters (Tilburg University)
Sankar Sen (Baruch College)
Alina Sorescu (Texas A&M University)

Guest Editor

Journal of Marketing thanks Steve Shugan for serving as a guest editor during 2010–2011

From the Editor: Reflections on the Review Process

This issue marks the last in my tenure as editor in chief (EIC) of *Journal of Marketing* (*JM*) It has been a privilege and an honor to serve in this capacity I have had the good fortune to work closely with coeditors Bob Leone and Gary Frazier, and I thank them for their skillful and selfless service to *JM*

The journal is in great shape, as evidenced by the metrics published by the Institute for Scientific Investigation's Journal Citation Reports for 2010 two-year impact factor, two-year impact factor adjusted for self-citations, five-year impact factor, and total number of citations *Journal of Marketing* is at the very top of all marketing journals on each of these metrics It is ranked number 6 in the business journals category This is an impressive accomplishment, for which much credit goes to the authors, who painstakingly developed and revised their manuscripts multiple times in response to reviewers' comments In addition, much credit goes to members of the editorial review board (ERB) and the hundreds of ad hoc reviewers, who selflessly contributed their expertise to improving manuscripts I extend my grateful thanks to each author, ERB member, and ad hoc reviewer who contributed to *JM* I also thank Christopher Bartone, managing editor, for the great skill and deftness with which he manages the crucial behind-the-scene operations The journal simply could not exist without the contributions of these people

Looking ahead, I am very bullish on *JM* It continues to attract an increasing number of manuscripts from across the world on a wide variety of topics and using a broad spectrum of qualitative and quantitative methods Importantly, as of July of this year, *JM* is in excellent hands with Gary Frazier as the EIC Gary is an accomplished scholar with substantial editorial experience He brings to the journal a great set of skills, values, and energy He has recruited exceptional scholars as area editors and put together a highly accomplished ERB This augers well for the continued growth of the journal, and I am very excited about its future

Looking back, I can count several privileges in serving as an EIC of a premier journal One of these is being able to see literally thousands of manuscripts and reviews and communicate with authors and reviewers at forums such as school visits and Meet the Editors sessions at conferences It forces an EIC to reflect on a variety of specific issues and evaluate the importance of each very carefully Because this is a relatively unique vantage point, I would like to share broadly a few general lessons I have learned (or relearned) and also discuss some specific issues that I had to reflect on deeply

I first discuss the general issues and then the more specific ones related to research contribution, theorizing, and empirical work Throughout, I offer implications for both reviewers and authors Lest my remarks be misunderstood, I would like to emphasize that the review process works very well in the overwhelming majority of cases Reviewers do an admirable job of evaluating papers and offering suggestions, and authors do an equally good job of addressing reviewer comments My objective is to offer ideas for consideration by both junior and senior scholars among us with a view to improving what is already a fine process

General Issues

The following points have become clearer to me over the course of my tenure as EIC

1 *The perfect paper does not exist* Every paper can be rejected for one or more reasons related to contribution, theorizing (including starting assumptions in the case of analytic work), and empirics (data and analyses) It is important for editors and reviewers to weigh all strengths of a paper against all its weaknesses and judge whether the strengths outweigh weaknesses to reach conclusions about the paper's acceptability To be clear, however, a threshold level must be met on each of the following criteria contribution, conceptual rigor, and methodological rigor

2 *A paper is a part of a conversation, not the final word on a topic* When a piece of research is exciting or provocative, reviewers sometimes push authors to do more to answer questions raised by their studies or even to answer questions that are on the fringes of what is being studied This is a natural and understandable reaction However, it should not be incumbent on authors to answer all questions raised by their research on a topic or to study questions that are outside the scope of the paper That is the responsibility of the academic community, not of the authors alone, and will happen as others in the community continue to study the topic

3 *Published papers rarely look anything like they did when they were first submitted* It is natural for editors and reviewers to compare papers submitted to a journal with articles published in that journal to assess acceptability This can be a mistake and result in a paper with a potentially good idea being rejected, because most papers improve substantially during the review process It is more productive if reviewers first ask whether there is a good idea buried in an initial submission and, if yes, whether they can suggest ways in which the paper could be revised to an acceptable level I hasten to add that it would be a mistake for authors to interpret this point as suggesting that they submit half-baked papers in the hope of revising them according to reviewers' suggestions Such papers almost always will be flatly rejected Reviewers find problems with papers that authors think are

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perfect, it is the reviewers' role to scrutinize papers critically. Authors should submit papers only after obtaining and incorporating critical feedback from trusted colleagues and assuring themselves there is nothing else they could do to improve their papers.

Next, I discuss some specific issues in three categories: (1) research contribution issues, (2) theorizing and conceptual issues, and (3) empirical issues.

Research Contribution Issues

Authors often fail to clearly articulate their research contribution(s). When reviewers push them to do so, they sometimes come back with broad and unsatisfactory statements such as "This research is the first study on xyz phenomenon," "This research applies xyz theory to pricing," or "This research integrates theory x with theory y." Such statements neglect to indicate precisely what new insights the studies generate. In my view, the contribution of a majority of studies can be summarized in a single sentence such as "In this research, we show (for the first time ever) that [key findings]." I believe most authors would be well served completing such a sentence (or two maximum) before crafting their papers. This would help them position their work and make it easier for reviewers to identify its value-add, thus working to the authors' advantage.

Assuming authors (or reviewers) can identify a paper's contribution, how might one judge its importance? A useful yardstick is this: How much thinking and behavior on the part of how many marketing stakeholders likely will change as a consequence of the novel insights of the paper? Relatedly, reviewers often raise concerns about the narrowness of single-industry studies, their (poor) generalizability, and thus the weak contribution. However, it is important to ask, "How damaging are concerns about single-industry studies?" I believe the answer depends on at least three considerations. First, how broadly is an industry construed? For example, if a paper focuses on the health care industry, an argument can be made that it is broad enough to be of interest in its own right. Second, in some cases, the empirical work may be done in a single industry, but the nature of relationships among variables studied may be argued to hold in other industries. In such cases, a single-industry study may not be a fatal limitation. Third, how deep are the insights? In some cases, the variables studied may be specific to the industry and not make sense in other industries (e.g., a particular movie genre in the motion picture industry). The contribution of such papers may be limited. However, even in such cases, a paper conceivably may offer disproportionately deep and useful insights to offset the narrowness of the single industry. In other words, it is helpful to think of the "area" of a paper's contribution—if the breadth is narrow, the depth must be greater.

Theorizing and Conceptual Issues

Reviewers often rightly point out that a manuscript's hypotheses have poor theoretical support. In response, authors sometimes tack on pages of verbiage that cite various "theories" and studies, often in stand-alone "Literature Review" sections. Frequently, this not only fails to provide theoretical support for the proposed hypotheses but also makes the papers less readable. Theoretical support for a novel proposition or hypothesis means articulating a reason the proposed (or uncovered) relationship between two variables (or among more than two variables, as in the case of moderation effects) should be expected to hold. In many cases, the reason can be provided in as little as a few clear sentences that draw on prior findings, assertions, and/or even common sense. Such reasons or arguments engender greater confidence in the proposed hypotheses than a dozen pages that restate what others have found previously but fail to clarify how those findings lead up to the proposed hypotheses. I believe it is important for us to keep this notion of "theoretical support" in mind, as both reviewers and authors.

A more fundamental question is this: Why is it important to provide theoretical support for hypotheses in the first place? The reason is simple. When authors provide reasons or arguments to suggest that the hypotheses are plausible or could be expected to hold on the basis of what else is known, we have greater confidence in the hypotheses. Just as our confidence in the replicability of certain hypothesized effects is greater when data are consistent with the hypotheses, so too is our confidence in the replicability of those effects greater when there are good reasons to expect them.

Why not let the data "speak for themselves"? That is, why not forget about theorizing and simply report the effects we find in a data set and leave it at that? This conceivably may be tenable if authors show that the effects replicate across diverse data sets. If not, there is little that could differentiate such an endeavor from running random regressions with variables in a data set and reporting the results as effects observed in the data. Furthermore, even if the effects are replicated across samples, doubts may persist if there is no good reason to expect the effects. For (an extreme) example, if a researcher were to regress a firm's market share on the height of its auditors' employees and find a statistically significant regression coefficient in multiple data sets, it is doubtful we would want to assert there is a causal relationship between the two variables.

This leads to a related point. Reviewers sometimes chastise authors for suggesting or even implying that the relationships they have found among variables are causal, especially in field studies and studies based on archival data. Authors are admonished to write about such relationships as (mere) associations. I am aware of the centuries of debate on the meaning of causality and the elusive nature of the concept. That said, it seems to me that we are (and should be) interested in causal relationships, and not (mere) associations, regardless of how we phrase our sentences. After all, why would we be interested in, say, advertising's association with sales if it were not causal? I believe we should be more accepting of allusions to causality in papers. Although conclusively establishing or "proving" causality is difficult, making inferences about causality with as much confidence as possible is a goal in much of our research.

An objection often raised by reviewers is that a paper does not draw on an overarching theory or framework to derive its hypotheses/propositions (and why some variables were included in a model but others were not). This objection can imply that there are some commonly accepted theories or frameworks "out there" and that each paper must start with one such theory/framework and derive all hypotheses from it. If interpreted in this way, this is a recipe for mediocrity because it forces all hypotheses to be subset of existing theories/frameworks, which stifles innovative thinking and research on new topics. Moreover, it raises the following question: If all hypotheses/propositions must be derived from previous ones, how did the currently "acceptable" theories come to be accepted in the first place?

Perhaps a useful way to frame the point is that hypotheses/propositions in a paper should cohere in some way. For example, the independent variables used across the hypotheses/propositions could have something in common (e.g., they may be specific facets of a more general construct). Alternatively, perhaps there is a common theme in the logic used to argue for the inclusion of the selected variables. Still, it may be asked why such coherence is important. It is important because it helps a paper provide an organized account of some phenomenon and also helps makes the investigation deeper and thus more insightful. The implication for us as reviewers is to be clearer about the exact concern we have about the variables included in a model. It would be even better if we could provide authors with an example of an overarching theory/framework or rationale for selecting a model's variables to give authors a clearer idea of what we would like to see. The implication for us as authors is to develop a paper using a set of variables and relationships that cohere in an identifiable way and to articulate it explicitly.

Empirical Issues: From a "Per Se" Mind-Set to a "How Else" Mind-Set

In some instances, reviewers' comments reflect a "per se" mind-set that deems a paper to be unacceptable because of a certain research design characteristic used in the paper's study. Every few years, our field seems to hone in on a research design characteristic with great passion. Examples include the use of undergraduate students in lab experiments, (merely) cross-sectional data, low response rates, single-informant studies, single-item measures, common method bias, omitted variable bias, selection bias, endogeneity, unobserved heterogeneity, and serially correlated errors, to name a few. The danger arises when we mechanically cite one or another characteristic as justification for rejecting a study, regardless of the extent to which that characteristic is a problem in the particular study and regardless of its other merits.

For example, a reviewer may dismiss a study on the basis of a simple but sweeping blow: "The study suffers from an endogeneity problem," or "Common method variance is a problem with the study." When such concerns are unwarranted or overblown, their mechanical citation is especially unfortunate if it leads to rejection of papers that address important problems. Such rejections hurt our discipline by shrinking its domain to narrow theoretical/substantive problems that can be addressed with research designs incorporating the latest technical machinery. Moreover, such rejections encourage other disciplines to focus on meatier problems that arguably should be addressed by marketing scholars.

Our discipline is likely to be well served if we as reviewers ask three questions: (1) To what extent is a research design characteristic a problem in the particular study being reviewed? (2) To what extent does the design characteristic likely affect the conclusions reached from the study? and (3) Could researchers realistically conduct the study with a better design? In other words, we as reviewers would be better off not recommending rejection of papers with a certain design characteristic *per se* and asking *how else* (and whether) the theoretical/substantive problem could be feasibly studied better. Next, I offer some illustrations that crop up periodically.

It is easy to knock lab experiments, especially with undergraduate students, as lacking in external validity. The real questions we as reviewers must ask are whether the specific findings/conclusions from the lab study are likely to hold outside the lab and why or why not. While this is a judgment call, it is better to make the call than to recommend rejection of a paper because it is a lab experiment with undergraduate student participants per se.

Stronger inferences of causality are justified when experimental designs or longitudinal data are used than when cross-sectional data are used. Again, it is easy to knock a study as being (merely) cross-sectional. However, cross-sectional data provide evidence that may (or may not) be consistent with causal relationships hypothesized by authors and are valuable to that extent. The important question to ask is whether it is feasible to study the theoretical/substantive problem of interest using an experimental or longitudinal design. In many instances, the answer may be no. For example, it may be difficult to persuade time-strapped senior executives to provide detailed information on the same variables at two points in time. In such instances, the choices are to go with the feasible design and the insights it generates or to abandon the pursuit of the theoretical/substantive problem. I would argue the field is better-off investigating interesting questions with the best feasible methods.

Reviewers sometimes find fault with (low) response rates obtained in primary data collected by authors and therefore the representativeness of the sample. While a good response rate is important when doing descriptive research such as profiling the means of a population's demographics, academic research is seldom of this nature. Most academic research focuses on relationships between and among variables. A low response rate should be of concern if there is plausible reason to believe that the relationships found in a sample are unlikely to hold in the population. Again, rather than objecting to a low response rate per se, it is more important to state why the relationships are unlikely to hold in a population.

Similar points can be made with respect to objections such as single-informant studies and single-item measures. For example, in some cases, a single informant may be preferable to multiple informants if the single-informant is most knowledgeable about the phenomenon being studied. (Why would we want to contaminate an accurate response with an uninformed one?) Likewise, although in general, multiple-items are to be preferred, in some cases a single item actually may be preferable (e.g., measuring sales revenues). Similarly, in some study designs with a large number of constructs, too many items per construct may wear out an informant and lead to lower quality responses.

In other cases, reviewers can overstate problems if they do not assess the extent to which a concern holds in the particular study at hand These concerns involve common method bias, omitted variable bias, selection bias, endogeneity, unobserved heterogeneity, and serially correlated errors Common method bias may or may not be a concern depending on the closeness of constructs whose relationship is being estimated and whether main effects or interaction effects are being estimated Omitted variable bias in a regression model is of less concern if the correlations between omitted variables and the included variables are likely to be small Selection bias would be a bigger concern if a reason can be articulated as to why the selected cases are likely to be different from the ones not selected A concern raised about endogeneity is more credible if the likely source of a variable's endogeneity is articulated The same applies to unobserved heterogeneity and serially correlated errors

I recall a recent conversation with a senior and very accomplished scholar on the concern related to endogeneity routinely cited in our field We wondered whether there existed any variable that is not endogenous We brainstormed several variables, but every one of them could be argued to be endogenous In the end, we concluded that perhaps only God may not be endogenous, but it would be difficult to convince some reviewers of that

My main objective in raising these points is to suggest that it is important for us as reviewers to examine the extent to which one or another research design characteristic is likely to be a problem in the particular study and also to identify realistic ways the concern can be or should have been addressed It is all too easy to reject/dismiss a paper using "per se" objections of the type noted previously A "how else" mind-set is more helpful than a "per se" mind-set

Conversely, it is important for us as authors to anticipate the objections reviewers are likely to raise and to address them as best as we possibly can *before* submitting our papers I have come to believe that reviewers are more receptive to papers whose authors appear to have carefully considered common reviewer concerns and addressed them to the extent possible As authors, we also help ourselves immeasurably when we take reviewers' comments to heart and respond to them in good faith rather than resort to expediency and do the least with which we think we can get by A simple rule of thumb is to do *more* than what is asked for by reviewers

To reiterate a point I noted previously, the review process works very well in the vast majority of instances Most of us take our reviewing responsibilities very seriously Likewise, most of us as authors do a commendable job of addressing reviewers' concerns and suggestions My objective in sharing these observations is to raise awareness and stimulate discussion to help make a fine process even better That is in our collective interest

AJAY K KOHLI
Editor in Chief

Wolfgang Ulaga & Werner J. Reinartz

Hybrid Offerings: How Manufacturing Firms Combine Goods and Services Successfully

This article examines key success factors for designing and delivering combinations of goods and services (i.e., hybrid offerings) in business markets. Goods manufacturers, unlike pure service providers, find themselves in a unique position to grow revenues through hybrid offerings but must learn how to leverage unique resources and build distinctive capabilities. Using case studies and depth interviews with senior executives in manufacturing companies, the authors develop a resource–capability framework as a basis for research and practice. Executives identify four critical resources: (1) product usage and process data derived from the firm's installed base of physical goods, (2) product development and manufacturing assets, (3) an experienced product sales force and distribution network, and (4) a field service organization. In leveraging these specific resources, successful firms build five critical capabilities: (1) service-related data processing and interpretation capability, (2) execution risk assessment and mitigation capability, (3) design-to-service capability, (4) hybrid offering sales capability, and (5) hybrid offering deployment capability. These capabilities influence manufacturers' positional advantage in two directions: differentiation and cost leadership. The authors propose a new typology of industrial services and discuss how resources and capabilities affect success across categories of hybrid offers.

Keywords: hybrid offerings, service transition strategies, resource-based view, business-to-business services, service classification, positional advantage

Traditional manufacturers have moved into service and customer solution fields to solidify their positions in increasingly competitive markets and grow their revenues and margins, leading to the well-documented shift from a goods-dominant to a service-dominant logic in business markets (e.g., Antioco et al. 2008, Neu and Brown 2008, Sawhney, Balasubramanian, and Krishnan 2004, Vargo and Lusch 2004, Wise and Baumgartner 1999). From a scholarly perspective, we know a great deal about the processes, antecedents, and consequences of designing and delivering successful service offerings, as most famously exemplified by the Gaps service quality model (Zeithaml, Parasuraman, and Berry 1990), the three-component model (Rust and Oliver 1994), and SERVQUAL dimensions (Parasuraman, Zeithaml, and Berry 1988). However, extant literature predominantly refers to *pure* services in consumer marketing settings, such as the airline industry, financial services, hospitality, and retailing.

This focus ignores a domain that may be critical: hybrid offerings. Shankar, Berry, and Dotzel (2007, p. 2) define a hybrid offering as a combination of "one or more goods and one or more services, creating more customer benefits than if the good and service were available separately." The same authors provide a much simpler definition in a managerial article: "hybrid solutions are products and services combined into innovative offerings" (Shankar, Berry, and Dotzel 2009, p. 95). We adopt the latter conceptualization, particularly with regard to hybrid offerings in business markets that combine industrial goods and services.

Moreover, we note increasing research interest in the successful deployment of goods–service combinations (Antioco et al. 2008). For example, Fang, Palmatier, and Steenkamp (2008) derive empirical evidence from longitudinal, aggregate, firm-level data about when and how goods-based companies generate shareholder value when they begin to offer ancillary services. The authors find that "the effects [of service transition strategies] on firm value become pronounced only after the level of service sales reaches a critical mass, which averages approximately 20%–30% of total firm sales" (Fang, Palmatier,

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and Steenkamp 2008, p. 11). In a recent study, Tuli, Kohli, and Bharadwaj (2007) provide a new approach for understanding customer solutions, a particular type of hybrid offerings in business markets. The authors show that customers and suppliers approach solution offerings from very different angles. Whereas vendors typically view solution offerings as customized and integrated combinations of goods and services for meeting a customer's business needs, customers perceive solutions as relational processes.

Despite this emerging body of research, we know little about what drives the success or failure of an effort to increase the service component (Bolton, Grewal, and Levy 2007; Neu and Brown 2008). In general, managers agree that they must move into services, but anecdotal evidence indicates mixed outcomes at best. According to a Bain & Co. study, only 21% of companies succeed with their service strategies (Baveja, Gilbert, and Ledingham 2004), and few firms that enter service markets outperform their pure goods-centric counterparts in terms of revenue growth, margins, or returns on equity. Stanley and Wojcik (2005) find that approximately half of all solution providers realize only modest benefits, and 25% actually lose money.

We contend that this evidence exemplifies our poor understanding of hybrid offerings compared with pure goods and pure services offerings. Which particular strengths in operations, product development, and marketing can a goods manufacturer leverage particularly well for hybrid offerings? What unique opportunities exist that pure service players cannot access? Rather than just a general agreement about why manufacturers move toward services, we need a better understanding of how they can ensure that their service activities succeed. To address this fundamental issue, we investigate three main research questions:

1. What distinctive capabilities must goods-focused manufacturers (compared with pure-service players) develop to generate successful hybrid offerings?
2. Which unique resources must manufacturers leverage to build these distinctive capabilities?
3. How can goods manufacturers translate unique resources and distinctive service capabilities into positional advantages, and how do these effects vary across different types of services?

By answering these questions, we make several contributions. First, using the resource-based view as a theoretical base, we identify resources and capabilities that are key for a successful hybrid offering deployment. We do not aim to generate an exhaustive list of generic capabilities; rather, we focus on specific resources and distinctive capabilities that goods-focused manufacturing companies deem most important for developing successful hybrid offerings. Then, we integrate those resources and capabilities into an overall conceptual frame. Second, considering the many types of hybrid offerings, we develop a fine-grained typology that reveals how different types of hybrid offerings moderate the link between service capabilities and positional advantage. In other words, when is a cost advantage more likely, or when is a differentiation advantage more likely to occur?

Conceptual Background

Organizations achieve competitive advantages predominantly by developing and deploying resources and capabilities (Peteraf 1993). Resources are productive assets the firm owns; capabilities are what the firm can do. Resources per se do not confer competitive advantage but must be transformed into capabilities to do so. An organizational capability is a "firm's capacity to deploy resources for a desired end result" (Helfat and Lieberman 2002, p. 725). If an organization is able to create such sources of competitive advantage, it may either translate them into a better cost position than competitors or be able to differentiate vis-à-vis competitors, which should increase its revenues. We draw on the well-established concept of the resource-based view (Barney 1991; Peteraf 1993) and its application to marketing (e.g., Day and Wensley 1988; Menon et al. 1999) to develop substantive new insights into which supplier-relevant variables drive profitable revenue growth through hybrid offerings.

We are specifically interested in two aspects. First, what unique resources do pure service players lack that manufacturers can leverage in the services domain by creating appropriate capabilities? In this sense, we consider which distinctive capabilities should be created, on the basis of those resources, to sell hybrid offerings successfully. In general, prior research has relied on the dichotomization between goods and services, which has benefited the field in the sense that we know a great deal about the strategic success factors for pure service environments (e.g., Bharadwaj, Varadarajan, and Fahy 1993; Zeithaml, Parasuraman, and Berry 1990). However, for many firm offerings, the core value proposition is explicitly its combination of goods and services, and the market space for these offerings continues to increase. Organizations still struggle to exploit those value propositions (Baveja, Gilbert, and Ledingham 2004), and academia offers them few insights to guide managerial actions, though some recent inquiries have appeared in major marketing journals (Fang, Palmatier, and Steenkamp 2008; Tuli, Kohli, and Bharadwaj 2007). Against this backdrop, we develop insights into the distinctive capabilities and unique resources required for goods-focused manufacturing firms that venture into the services space.

Second, establishing a competitive advantage requires a strategy that exploits the uniqueness of the firm's portfolio of resources and capabilities (Barney 1991). Services are diverse by their very nature (Boyt and Harvey 1997; Frambach, Wels-Lips, and Guendlach 1997; Lovelock 1983), so depending on the type of good–service combination, the critical resources and capabilities might be very different. In other words, we cannot determine which unique resources and capabilities are required to garner competitive advantage without considering heterogeneity in hybrid offerings. Therefore, we develop a typology of goods–service combinations to establish a more granular distinction of the proposed effects.

For our empirical foundation, we tap into the experience and learning gained by key decision makers who manage the transition from goods to hybrid offerings in their firms. We thus empirically identify and describe key resources and capabilities involved in generating successful offerings by manufacturing firms that have gained experience in their shift toward service-led growth. Considering the sparse academic literature on the performance of service strategies in business markets, we adopt a discovery-oriented, theory-in-use approach (Deshpandé 1983). Rather than relying on a hypothetico-deductive approach, we develop our framework from a managerial perspective (see also Tuli, Kohli, and Bharadwaj 2007, Ulaga and Eggert 2006) With data from a grounded theory approach (Glaser and Strauss 1999), we derive insights into resources and capabilities and advance propositions regarding the effect of capabilities on cost reduction and differentiation efforts, contingent on different types of good–service combinations

Data Collection

Pilot Studies

We used two pilot case studies to familiarize ourselves with the study's context, gain insight into the main issues regarding their firms' service growth strategy, and craft our interview guide for subsequent interviews (Yin 1994) In this stage, we met with multiple managers across functions and hierarchical levels from a leading global company in the industrial gases sector and a European leader in the material handling equipment industry

From the staff of the industrial gas supplier, we interviewed senior executives in charge of services across strategic business units that provide services and solutions to customers in different industries Over six months, we met with eight managers (e g , European services marketing manager, vice president of marketing, local services sales manager), both at corporate headquarters and in local country organizations In the material handling equipment company, we met with the five key decision makers involved in designing and implementing the medium-sized company's service strategy, including the parent company's chief strategy manager, who coordinates service initiatives at the group level

We summarized the data in the form of a memorandum about each case and jointly reviewed both memoranda to discern emerging themes and specific issues raised by the managers From these initial analyses, it became clear that the concerns the 13 managers expressed centered on the resources and capabilities that manufacturers need to develop when seeking service-led growth in business markets Accordingly, we crafted a semistructured interview guide for the second stage that aimed at systematically identifying and defining the resources and capabilities that managers consider key for successful service-growth strategies

Depth Interviews

In the depth interview stage, we gathered data through in-depth interviews with senior managers, whom we contacted through the alumni network of two major European business schools The sampling process ceased at saturation, as indicated by information redundancy Our qualitative sample consists of key decision makers in 22 manufacturing companies, consistent with the sample sizes recommended for exploratory research (McCracken 1988)

Sample characteristics The key sample characteristics in Table 1 show that the respondents represent industrial companies operating in various product markets, including adhesives, automotive coatings and glass, bearings, cables and cabling systems, energy generation and distribution, onboard electronics for civil and military aircrafts, printing presses, and specialty chemicals The companies range from medium-sized manufacturers to *Fortune* 500 corporations Every firm ranks among the top three in its industry, and the interviewed managers are key decision makers, including several executive board members

In developing our sample, we aimed to maximize diversity among the participants, so we could uncover critical hybrid offering capabilities and resources However, we also needed the study participants and firms to share some characteristics to allow for comparability Therefore, each firm's activities are deeply rooted in manufacturing, but they display very different backgrounds in terms of experience beyond their core product business Some had developed ancillary services and customer solutions for almost two decades, others had just begun Similarly, we sought diversity in the functions and hierarchical levels represented by the participants Because we relied on key informants, we needed influential decision makers who led service initiatives and policies for their respective firms, so we invited only senior-level managers to participate Respondents' ages ranged from 39 to 53 years

Interview guide In the first part of the interview, respondents described their core business and market environment, explained the role and scope of hybrid offerings and the organization of these activities within their company, and detailed how their hybrid offerings had evolved over time Thus, we gained an understanding of each company's core markets and its efforts to develop hybrid offering activities associated with its goods-dominant business

In the second part, respondents indicated the extent to which they considered their companies successful in developing hybrid offerings To facilitate the process, we asked participants to provide examples of specific initiatives and offerings, which we used to probe their different capabilities and resources We aimed to generate examples of both successes and failures, probe the specific facets and meanings of each capability and resource identified by the managers, and understand differences across various types of offerings We also attempted to understand how the managers judged performance outcomes, beyond revenues and margins Therefore, we carefully phrased the questions to elicit responses in an unobtrusive, nondirective manner and avoid the potential pitfalls of "active listening" (McCracken 1988, p 21) Our main objective was to facilitate the emergence of key resources and capabilities, grounded in the managers' own language, rather than capturing relevant variables that we had already specified The interview concluded with respondents describing themselves and their company background

Analysis and Interpretation

Interviews lasted, on average, one and a half to two hours Each interview was audiotaped and transcribed verbatim To identify distinctive capabilities and unique resources, we turned to grounded theory coding, which involves open, axial, and selective coding (e g , Strauss and Corbin 1998) Both lead researchers began by independently undertaking open coding, paragraph by paragraph, to identify the critical resources and unique capabilities mentioned in the verbatim transcripts Any resources and capabilities that emerged during the analysis were transcribed in the margins and then labeled with in vivo or descriptive codes (Strauss and Corbin 1998) We compared our results, discussed any differences in coding outcomes, and jointly developed a preliminary coding plan that (1) listed the resources and capabilities identified, (2) provided a label and definition for each construct, (3) specified the respective properties

TABLE 1
Qualitative Study Sample

Participant Background	Company Size	Service Offering and Underlying Good
Service business development manager, age 49	Sales[d] €186 million Employees[d] 293	Remote monitoring[a] Offset printing press[b]
Director, service business, age 43	Sales[d] €600 million Employees[d] 3000	Preemptive maintenance[a] Automated welding machine[b]
Sales director, industrial tires Europe, age 44	Sales[d] €351 million Employees[d] 2396	Automatic parts replenishment[a] Industrial full rubber tire[b]
Corporate director, fleet solutions, age 44	Sales[c] €16 8 billion Employees[c] 121,356	Fleet management[a] Truck tires[b]
Vice president, sales and services, age 47	Sales[d] €721 million Employees[d] 2540	Rental/lease contract[a] Forklift truck[b]
General manager, service support center, age 39	Sales[d] €744 million Employees[d] 2175	"Fly-by-the-hour" agreement[a] Aircraft engine[b]
Member, board of management, vice president, strategy and services, age 52	Sales[c] €17 3 billion Employees[c] 119,340	Energy efficiency consulting[a] Electricity meter[b]
Marketing director, strategic business unit services worldwide, age 39	Sales[d] €2 6 billion Employees[d] 13,000	Videoscreen uptime guarantee[a] In-flight entertainment system[b]
Chief executive officer, country subsidiary age 53	Sales[c] €8 9 billion Employees[c] 24,000	Crop protection assistance[a] Insecticide[b]
Vice president, solutions, age 51	Sales[d] €2 7 billion Employees[d] 16,500	Performance agreement[a] Power plant coolant pump[b]
Head of strategy, thermal coal business, age 40	Sales[c] $59 4 billion Employees[c] 33,800	Multisourcing contract[a] Coal mining[b]
Key account sales director Europe, age 54	Sales[d] €877 million Employees[d] 1563	Asset optimization[a] Ball bearing[b]
Member, board of management, age 53	Sales[c] $72 billion Employees[c] 450,000	IT solution[a] MRI scanner[b]
Account manager, age 45	Sales[c] $1 3 billion Employees[c] 5700	Customization service[a] Design automation software[b]
Member, board of management, national subsidiary, age 38	Sales[d] €362 million Employees[d] 1387	Tool fleet management[a] Construction tool[b]
Global services director, Europe, Middle East, and Africa, age 47	Sales[c] €400 million Employees[c] 1400	Project management[a] Id card printer[b]
General manager, Europe, age 45	Sales[c] $11 2 billion Employees[c] 34,900	OEM paint shop solution[a] Automotive coatings[b]
Director customer service, age 40	Sales[c] €13 5 billion Employees[c] 57,100	Document management[a] Office printers[b]
Head of services, Europe, age 52	Sales[d] €4 6 billion Employees[d] 17,300	On-site gas management[a] Industrial gas[b]
General manager, aftermarket sales, Europe, Middle East, and Africa, age 47	Sales[c] € 8 billion Employees[d] 3300	Equipment retrofitting and upgrades[a] Injection molding systems[b]
Business development manager, emerging markets, age 51	Sales[c] €9 billion Employees[d] 43,400	Design and project management[a] Elevators and escalators[b]
Sales manager, equipment and service, age 38	Sales[c] $ 6 billion Employees[d] 1400	Total maintenance and repair agreement[a] Heavy construction/mining equipment[b]

[a] Main service offering discussed during interview
[b] Good underlying the service offering
[c] Company size worldwide
[d] Company size strategic business unit

of each construct, and (4) delivered an example to illustrate its meaning and content To decide whether to include various individual resources and capabilities, we relied on three key criteria similar to those used by Tuli, Kohli, and Bharadwaj (2007) (1) Is the resource and/or capability applicable beyond a very specific context? (2) Did multiple participants mention the resource and/or capability? and (3) Does the resource and/or capability go beyond the obvious to provide interesting and useful conclusions?

In the second step, we moved to axial coding and laid out the properties and dimensions of each resource and capability identified in the previous step We also investigated relationships between constructs As Strauss and Corbin (1998) recommend, we first assessed how each resource and capability related to other variables before developing our overall framework. As a result of this step, we refined our coding plan further. Finally, for the selective coding step, we integrated all resources and capabilities into an overall framework. We both reviewed the scheme for internal consistency and refined the wording of the definitions and the selected examples.

As a check on the reliability of our findings, we asked two independent judges to review the coding plan and instructions, as well as the verbatim transcripts, and verify the accuracy of the resources and capabilities we identified. We assessed interjudge reliability according to Perreault and Leigh's (1989) index of reliability, which reached .89, well above the .7 threshold recommended for exploratory research (Rust and Cooil 1994). To enhance content validity, we also provided the study participants with a summary report that included the framework, definitions, and examples of resources and capabilities. Thirteen respondents returned written comments indicating their agreement with the overall structure of our framework. However, several managers suggested slight changes in the wording of the definitions to increase their conceptual clarity. One manager also requested the elimination of an illustrative example for confidentiality reasons. Finally, we presented our framework and definitions to marketing and sales managers in two executive education workshops. They individually reviewed our definitions of the service capabilities and underlying resources and provided written feedback regarding how well they reflected actual practices. The participants also shared their views on the definitions and overall framework in a group discussion. These executives again agreed with the overall structure of our framework and offered only minor suggestions regarding the wording of the definitions. The trustworthiness of the results is also evident in the formal application of grounded theory criteria (Glaser 1998)—fit, relevance, workability, and modifiability—as we summarize in the Web Appendix (http://www.marketingpower.com/jmnov11). Overall, the formal coding process as well as the trustworthiness assessment gave us the confidence that our results captured the key variables related to the success and/or failure of hybrid offerings in manufacturing firms.

Strategic Resources and Capabilities

The research questions to be addressed in this section are as follows: What are the key capabilities that goods-focused manufacturers need to develop when generating successful hybrid offerings? and Which unique resources must they leverage to build those capabilities? Figure 1 integrates the resources and distinctive capabilities identified in our research into an overall framework.

Relevant Resources Available to Manufacturing Firms

A firm's resources are the stocks of available factors owned or controlled by the firm (Amit and Schoemaker 1993). Manufacturing firms, compared with pure service firms, have different stocks of relevant resources (Bharadwaj, Varadarajan, and Fahy 1993). We focus on which of these manufacturer-specific resources may be most critical and useful for developing hybrid offerings. Our interviews revealed four such unique resources, which we describe in the following subsections.

Installed base product usage and process data. The installed base of goods represents a unique asset for most manufacturing firms (Wise and Baumgartner 1999). For example, the manufacturer of printing presses in our study possessed a complete record of products it had sold in the past and in use by its customers. If a firm services its installed base through maintenance and repair agreements, it can collect product usage and customer process data systematically. The growing role of smart technologies also has improved manufacturers' access to strategic customer data (Rijsdijk, Hultink, and Diamantopoulos 2007). Watson et al. (2002) offer a conceptual foundation for marketing based on ubiquitous networks. Goods are increasingly equipped with information and communication technologies and form extensions of networks. In a networked world (i.e., remote control over and data capture by smart technologies), manufacturers thus control a powerful resource in terms of product usage and process data in the installed base. As one participant explained:

> Today, our forklift trucks are equipped with a multitude of data sensors. We remote-monitor operations on a real-time basis, 24/7, which allows us to collect data on how many hours the forklift truck runs per day, how many hours of downtime the equipment endures etc. We consolidate all that data in an online database.

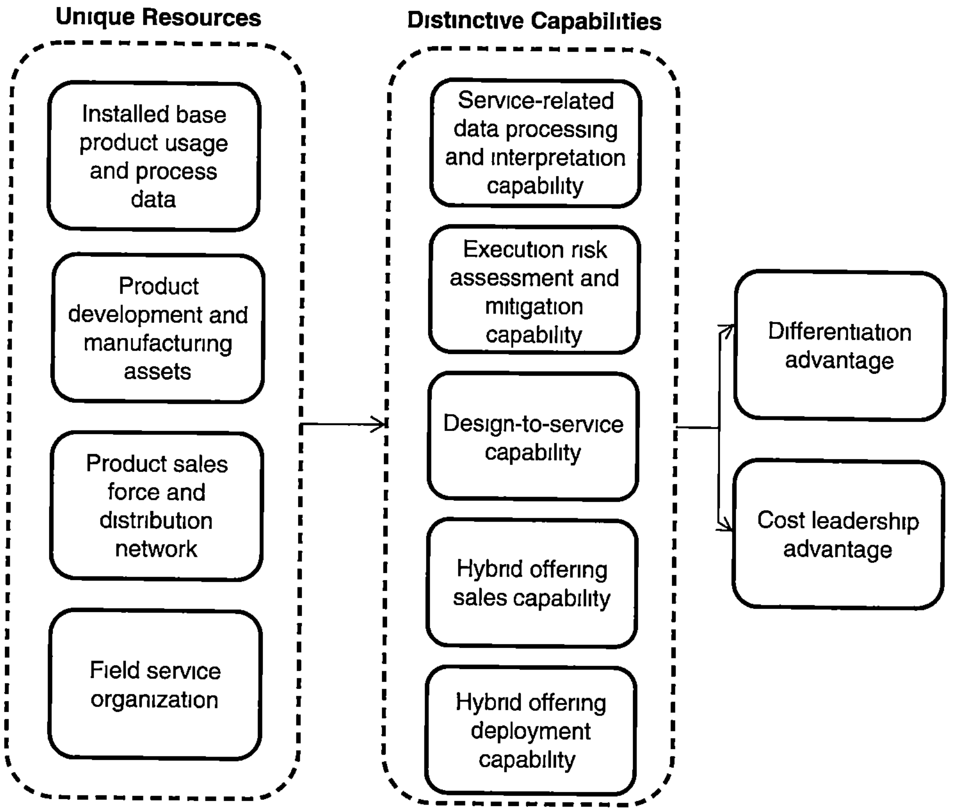
In many instances, participants explained that access to data represented a unique asset that their firms jealously protected to differentiate themselves from other manufacturers and keep pure service players at bay. As another participant mentioned:

> In energy efficiency services, we're not afraid of those consultants. Let them chase after customers with their PowerPoint presentations. We'll always beat them because when it comes down to comparing them versus us, customers understand that we are in the pole position. We build those electricity meters, we install them, we run them and we have all the historic data of how electricity flows in that building. That's unique.

To further protect access to this unique resource, several executives underscored that their companies systematically designed goods in such a way that neither competitors nor pure service players could properly provide service on their equipment. Suppliers in our study mentioned that customers often did not collect product usage or process data in a systematic way, let alone develop specific service-related data analysis skills.

Product development and manufacturing assets. Unlike pure service providers, manufacturers hold a stock of unique assets related to research and development (R&D) and production. These specific resources, both tangible (e.g., production tools, specific components) and intangible (e.g., patents, licenses), are geared toward developing and producing goods. Key manufacturing principles, such as process standardization, quality control, capacity management, and rapid prototyping, thus represent familiar terrain. However, for a manufacturer, the goal is to leverage these

FIGURE 1
Manufacturer-Specific Resources and Capabilities for Successful Hybrid Offerings


Unique Resources
Installed base product usage and process data
Product development and manufacturing assets
Product sales force and distribution network
Field service organization
Distinctive Capabilities
Service-related data processing and interpretation capability
Execution risk assessment and mitigation capability
Design-to-service capability
Hybrid offering sales capability
Hybrid offering deployment capability
Differentiation advantage
Cost leadership advantage

goods-oriented resources for the development of hybrid offerings For example, Markides and Williamson (1996) suggest that knowledge and resource spillovers likely help firms exploit synergies between manufacturing and services We suggest that manufacturing firms may enjoy a unique position in which they can draw on these specific resources to achieve a competitive advantage over direct competitors and pure service players in developing superior hybrid offerings For example, the tire manufacturer in our qualitative sample developed a new tire casing that allowed it to regroove and retread its tires more often than its competitors could As a result, customers' trucks could go tens of thousands of miles more with the vendor's tires than with any other competitive tire This tire-related innovation objectively contributed to lowering trucking companies' total cost of ownership The manufacturer initially tried to sell its tires at a higher price, but to no avail, likely because customers did not perform tire management in an optimal manner, so they could not reap the benefits of this innovation Because they did not perceive the value of the higher-priced tire, customers were simply unwilling to pay Over time, though, the manufacturer learned that its technology-related choices for the tire casing—which represented tangible resources in the form of differentiated goods—offered a unique asset that neither competitors nor third-party service providers could promise

Product sales force and distribution network Manufacturers typically rely on personal selling In general, business-to-business (B2B) firms invest in direct sales organizations or work with channel intermediaries to cover sales territories Investments in a goods-centric sales force allow manufacturers to build unique resources that enable privileged access to customers and reinforce ties with key contacts, typically in procurement and technical positions

> We have a very efficient product sales force of 600 sales reps nationwide Our people know the technical characteristics of our power tools pretty well They are trained to present the key features in the most effective way We expect a sales rep to be able to promote the unique benefits of a tool within a time window of no more than five minutes Our guys know the procurement manager, they regularly meet with the maintenance guy Therefore, they can make the sales pitch in no time

Manufacturers further rely on channel intermediaries to cover sales territories For example, one equipment manufacturer in our sample generated 90% of its sales through a network of more than 2000 exclusive and independent distributors With an average sales force of four to eight sales representatives in each dealership, the company steered sales through a powerful distributor organization However, the manufacturer's service revenues stagnated at well below 20% of overall sales The respondent complained that his firm had not found a way to leverage its dealer network, though considered as a unique resource in the market, to its full potential for growing service sales

Field service organization Most manufacturers invest into field organizations to deliver and install goods and service their installed base. After-sales services often represent a high-margin business that accounts for a significant portion of manufacturers' profits. Cohen, Agrawal, and Agraval (2006) report that businesses typically earn 45% of gross profits from their aftermarket, though it accounts for only 24% of revenues. These authors also argue that manufacturers often fail to get the most out of their investments in service networks; the participants in our study similarly underscored the bottleneck created by their field service organizations, due to scarce human resources.

> We find it extremely hard to recruit and keep good service technicians. There's a blatant shortage of high-quality people, especially as our equipment isn't the most attractive in the eyes of well-trained service employees in other industries. We try to hire them away with attractive salaries, but it hasn't been easy.

The manufacturers explained that field service networks represented not only a key resource for providing after-sales services cost effectively but also an opportunity for venturing into new and more complex hybrid offerings. However, several managers complained that a lack of resources slowed their efforts to increase revenues in this area.

The four resources highlighted here represent unique resources that goods-focused manufacturers might own. These resources are critical inputs to the construction of distinctive capabilities important to the successful deployment of hybrid offerings.

Relevant Capabilities Available to Manufacturing Firms

Capabilities refer to a firm's capacity to deploy its resources (Amit and Schoemaker 1993). From our empirical analysis, we derive a set of capabilities that are particularly useful for the successful launch of hybrid offerings, seem more likely to be developed by goods-dominant firms with their unique resources, and are rather new to services and marketing literature.

Service-related data processing and interpretation capability. As the previous section on manufacturer-specific resources reveals, product usage and process data derived from an installed base represent potentially unique assets for manufacturers (Allmendinger and Lombreglia 2005, Shugan 2004). Acquiring strategic customer data is a necessary though not sufficient condition. Manufacturers still must determine how to translate these data into a source of new revenues and/or an opportunity to provide existing offerings at lower costs.

For example, the industrial equipment manufacturer we interviewed had installed dozens of electricity meters in commercial buildings to monitor customers' energy consumption. Using its unique data access, the manufacturer developed specific capabilities for analyzing energy consumption, which became the basis for distinctive skills in facility management. As a consequence, the company achieved an ideal position to provide energy efficiency consulting services to business customers, which became a new source of revenue generation for the firm. The vendor also gained a competitive edge over pure service providers, consulting firms, or even power utilities, because customers highly valued its ability to analyze data and provide new insights for better building management, which flowed from its previously installed base of electricity meters. Similarly, the bearings manufacturer we interviewed systematically collected data on customer machines through condition monitoring and vibration analysis. The vendor then used these data to perform analyses, gain deeper insights into customer operations, and develop suggestions to improve machine uptime. In many cases, the bearings manufacturer became more knowledgeable than customers themselves about certain factory operations, which represented a basis for providing new offerings related to asset optimization.

Therefore, the core capabilities in this domain extend beyond skills usually described in marketing literature, such as customer-centricity (Shah et al. 2006, Slywotzky 1996), customer intimacy (Treacy and Wiersema 1993), and customer orientation (Olsen, Slater, and Hult 2005). Vendors need deep insights into how they can leverage product usage and customer process data to grant customers benefits in terms of productivity enhancements and/or cost reductions. The key challenge from a supplier's perspective is to realize how to use data to add value to the customer's bottom line.

> We sell ATM machines for customers in retail banking. To develop our solution offerings, we went beyond the usual interviews or customer satisfaction surveys. Instead, we took a deep dive into the economics of retail banking and studied how the data we have on consumers' usage of ATM machines could be leveraged for improving cash management in retail banking operations. Moving cash in and out of a branch costs a bank a tremendous amount of money. So, we wanted to understand how we can help them save costs in their operations. At the same time, we knew these guys look for new ways to differentiate themselves. In that industry, the ATM is a key touch point for managing customer relationships. So, we wanted to know how we can help the bank's marketing people to improve consumers' interactions with their bank. . . . It's not that we have to become experts in how to run a bank. But we need to know how we can add value to their bottom line. The question is, Do we understand their business model? and Can we help them?

Thus, service-related data processing and interpretation capabilities refer to the manufacturer's capacity to analyze and interpret product usage and customer process data from an installed base, using advanced monitoring and communication technologies, and then use those data to develop hybrid offerings that allow customers to achieve productivity gains and/or cost reductions. Although capabilities usually draw on several resources simultaneously, the underlying primary resource here is product usage and process data derived from an existing installed base.

Execution risk assessment and mitigation capability. Risk, or "the extent to which there is uncertainty about whether potentially significant and/or disappointing outcomes of decisions will be realized" (Sitkin and Pablo 1992, p. 10), has been investigated in relation to many aspects of managerial decision making. In our case, hybrid offering execution risk refers to uncertainty about whether contractually agreed-on outcomes of hybrid offerings will be achieved.

Execution risk assessment and mitigation skills emerged as critical to strike a balance between designing a competitively priced hybrid offering and still maintaining internal profit targets. This balance is a key challenge, largely because of the uncertain nature of future resources needed to meet performance level commitments (e.g., 98% machine availability). Thus, goods manufacturers face the risk of committing to outcomes they cannot deliver in the execution process or that only can be achieved by adding unforeseen resources. This risk is particularly acute when customers' actions, which the vendor cannot control, affect service performance—a classical moral hazard problem.

> We provide construction firms with fleet management for their tools. Instead of buying equipment, customers pay a fixed monthly charge that covers all tool, service and repair costs. That greatly simplifies their lives and cuts out lots of hidden costs. Yet, over time, we found that some construction workers changed their behavior once they knew that tools were now covered through a contract. They handled the tools less carefully, and we found ourselves with soaring costs for repair and shipments. We hadn't anticipated these costs, and it took us a while to learn how to keep these costs in check by introducing personalized tool labels and online tracking.

Participants mentioned three approaches to managing execution risks when designing and delivering hybrid offers. A first approach involved pricing, such that manufacturers built price buffers into their agreements to safeguard their contract profitability. For example, one company systematically raised prices in situations in which customers required contractual performance commitments. However, this simplistic approach often failed, because the company found that by hedging risk through higher prices, it effectively priced itself out of the market.

A second approach relied on pooling risk across multiple accounts, which effectively redistributed that risk across a broader base, as is widely practiced in inventory management with random demand (Eppen 1979) and in financial portfolio theory (Markowitz 1987). The following quote from one of our participants illustrates the key role of the critical size needed to pool the execution risks across a sufficiently large customer base:

> We quickly learned that to roll out our solution offer, we couldn't just sell a few performance-based contracts here and there. We had to achieve a critical mass to spread out execution risk across many customers. One customer can't handle downtime risks alone. But, if we group them, and if we bundle that risk, then it becomes manageable. To me, there's no surprise that it's only the leaders in many industries that go after those complex performance-based agreements. You need to have a critical size. A small "boutique" player just can't handle that kind of risk.

Finally, several firms had built effective risk evaluation skills based on their in-depth analyses and understanding of archival contract performance data. They felt confident in their ability to construct reliable outcome expectations and meet contractually agreed-on performance thresholds while still keeping their prices competitive.

Developing these specific skills represented a major cultural shift for many firms. Consider the example of the tire manufacturer:

> To successfully sell fleet management solutions, our company had to gain deep knowledge in correctly assessing the risks involved in taking responsibility of individual customers' tire fleets, learning how to spread tire management risks across multiple trucking companies, and proposing solution contracts in such a way that we were able to meet customers' expectations while maintaining profit margins for individual contracts. Imagine the culture shock that these changes involved. Deep down in our DNA, we still are a manufacturer. But we had to acquire actuarial expertise, we had to bring in people with entirely different skills and mind-sets and learn how to evaluate and take risk.

The participants in our qualitative study repeatedly explained that it took a willingness to accept a steep learning curve to develop these skills over time. However, once acquired, strong execution risk assessment and mitigation capabilities represented a powerful source of differentiation from competitors. We thus define execution risk assessment and mitigation capability as the manufacturer's capacity to evaluate uncertainty about whether contractually agreed-on outcomes of hybrid offerings will be realized and then to design and implement safeguarding mechanisms to meet performance commitments while still maintaining internal profit targets. The underlying primary resource for this capability is the product usage and process data derived from the existing installed base, which delivers the necessary facts to assess risks and hedge against negative outcomes.

Design-to-service capability. Managers noted a third major challenge faced by their firms: to develop hybrid offerings in which product and service elements interacted synergistically for value creation rather than in a merely additive manner. Extant research on innovation focuses mostly on goods rather than services (Meyer and DeTore 1999). Recent studies suggest that new product development and new service development follow similar underlying mechanisms, with drivers that differ in their relative importance (Nijssen et al. 2006). In line with this claim, managers asserted that their firms needed to incorporate the service component early in their innovation processes. Respondents agreed that their firms overly emphasized technical product features and did not sufficiently "think service" in their innovation efforts.

> One of the main problems we face is that we don't think "service" when it comes to innovation. Our R&D efforts are geared towards products. Take our most recent tire launch. Our product development folks focused their attention on improving product features. This tire beats competition on any possible technical criterion that you can think of. Problem is customers are not willing to pay for an overengineered product. When we sought for other ways of squeezing value out of this technological beauty, we found that we could change the business model and sell an outcome, instead of selling features. Did we plan this from the outset? Did we build service capabilities in the tire from the beginning? No! Were we happy when we learned that we could do so much more with the tire down the road? Yes! To be honest, we were lucky. We didn't take a systematic approach, but we should "think service" from scratch whenever we design a product.

As this quote shows, deliberately designing a component, a finished good, or equipment with the ambition to unlock new service opportunities provides manufacturers with a competitive advantage in two directions First, it allows the firm to go to market with innovative new hybrid offerings, that is, it enables effective differentiation For example, design-to-service capabilities enabled the manufacturer of ATM machines in our sample to venture into innovative offerings related to cash management for corporate customers in retail banking Second, design-to-service capabilities allow manufacturers to identify opportunities for cost reduction when delivering hybrid offerings For example, by retrofitting its offset printing presses, one manufacturer enabled its service technicians to perform first-level maintenance remotely, thus reducing the number of costly on-site interventions Pure service players are at a competitive disadvantage in both domains because they lack access to the offering's underlying physical product features and cannot influence technical design decisions

We therefore define design-to-service capabilities as the manufacturer's capacity to develop a hybrid offering such that its tangible and intangible elements interact synergistically to tap its full differentiation and/or cost reduction potential The underlying primary resource in this case is the product development and manufacturing assets that a goods manufacturer possesses

Hybrid offering sales capability Long-standing interest in marketing and sales literature pertains to the characteristics of effective salespeople and selling approaches (Franke and Park 2006) However, our knowledge of systematic selling differences based on the nature of the offering remains minimal Dubinsky and Rudelius (1980) assert that selling techniques vary for goods versus services, but research has not clarified the unique characteristics of the sales approaches or distinctive capabilities required for mastering hybrid offering sales

Our participants agreed that selling hybrid offerings requires a very different approach than selling goods Managers explained that the sales process is more complex and longer In addition, when selling goods, vendors generally attempt to meet customer-defined specifications, whereas the object of a hybrid offering sale is rarely well defined from the outset They require strong customer involvement, or even cocreation, to elaborate the offering Finally, hybrid offering sales frequently involve multiple actors, across both the customer and the vendor firms

These specific characteristics explain why salespeople need very specific sales skills, including a capacity to move beyond their comfort zone and access different decision makers in the customer organization, often higher in the hierarchy

> You need to develop the right argument for the right person Don't talk to a warehouse manager if you want to sell consultancy for productivity The higher the contact person in the customer organization, the easier it is to talk about value-added services The higher you go in a customer's management, the more vision they have on a problem

They also need to reach deep into their own organization and develop the skills required to consult and coordinate with other employees Therefore, hybrid offering salespeople require networking capabilities, both internal and external Finally, they must roll out different arguments, specific to each of their customers Hybrid offering sales thus require a capacity to switch from selling product features to selling value This demand also exists in other sales contexts, but it becomes particularly salient here For example, one manager trained the sales force to understand how customers justify investment decisions internally, so they learned how to help customers' decision makers recognize the return on investment for their own organization When selling hybrid offerings, managers typically want their sales force to "sell the broader picture" instead of just focusing on individual products

> It's difficult to start small and try to expand later on Our salespeople must understand the benefits of promoting the bigger frame rather than selling something For example, we started one service deal with a budget proposal of €500,000 But then we discussed the broader picture, and we landed the deal at €1 3 million Competition was at €950,000, but we won the deal

A fine-grained understanding of the capability required for hybrid offering sales also allows for a better understanding of the specific challenges manufacturers face regarding their use of unique resources in sales and distribution First, unlike pure service players, hybrid offering suppliers typically are challenged to "infuse" hybrid offering sales into their existing sales model rather than simply replacing goods sales with hybrid offering sales As a consequence, manufacturers face the unique challenge of balancing the portfolio of salespeople who can sell goods, services, and combinations The necessary characteristics and required skills suggest several distinct personality traits, as illustrated by the managers in our sample For example, one manager claimed, "Product salespeople are from Mars, while services salespeople are from Venus " The distinction resonates well with anecdotal evidence in the business press that describes "hunters" (product salespeople) versus "farmers" (service salespeople) It also is in line with extant research into the effect of individual traits on sales performance (Kohli, Shervani, and Challagalla 1998) Second, manufacturers need to train frontline employees to facilitate or even perform hybrid offering sales As one respondent explained, field technicians can "make or break" a sale They often represent a key source in identifying opportunities

> Our service technicians are a big asset in promoting services They are permanently on-site at the customer's facilities and see what's going on They help the sales force make the deal For example, when delivering gas cylinders to customers' premises, we found that clients would ask truck drivers to connect a gas cylinder to their system while they were on-site That activity was a value-added service for customers Instead of providing the service "for free," we recast it into a "for-fee" option Today, our salespeople sell it as a separate service Some of our technicians are great at identifying opportunities and promoting services But others just don't think that "selling" is part of their job

Third, because manufacturers typically rely on channel intermediaries for indirect sales, several participants emphasized that firms must ensure that hybrid offering sales initiatives align with the goals and activities of their distribution network. Fourth, managers explained that manufacturers need to use specific sales tools that assist salespeople in documenting and communicating the value of a hybrid offering to their customers. Using specific value communication tools emerged as an Achilles' heel for many:

> The key challenge is to get the customer understand the value of your remote monitoring offer. Make it tangible. A nice PowerPoint may be beautiful, but what is the reality in the end? Depending on who you're talking to, you must convince them that what you have is something factual. So people can start to visualize what the value of your monitoring package really is.

The successful companies in our sample relied on various approaches to communicate value to customers, including web-based payback simulation tools, white papers that documented the value that specific customers gain from their offerings, and case studies describing similar situations. One firm used proprietary software to demonstrate the savings customers could gain with its hybrid offerings, linked to a database of comparisons with the best practices of other customers worldwide.

Against this backdrop, we define hybrid offering sales capability as the manufacturer's capacity to reach key decision makers in the customer organization, coordinate key contacts in the customer and vendor firms, sell hybrid offering value through specific documentation and communication tools, and align the sales force with both the field organization and channel partners to increase hybrid offering revenues. The underlying primary resource for this capability is the manufacturer's existing sales force and distribution network.

Hybrid offering deployment capability. Finally, managers consistently mentioned the need to strike a balance between ensuring efficiency and effectiveness in hybrid offering production and delivery processes. The suppliers highlighted the ability to standardize back-office processes while maintaining front-office customization. In a manufacturing environment, these suppliers were accustomed to stable and controllable production processes. However, growing into hybrid offerings forced them to wrestle with the inherent variability of service operations. Thus, a manufacturer's standardization capabilities emerged as paramount:

> To earn money in services, you need to industrialize the back office. Take companies such as GE and IBM. They really are process freaks. What we've learned from these firms is that you need extreme rigor in the back-office.... When we first developed services, profitability was poor. We quickly understood that we had to focus on execution. For example, when maintaining equipment on site, a technician may easily screw up an electronic circuit board in the machine. If that board is worth €800, while the entire repair job is billed €1,000, then profitability will go downhill. So, we standardized our service processes. We gave our technicians toolkits and trained them how to intervene on-site. Six years ago, operating margins in services were negative, −11.5%. Today, we have reversed the situation. Operating margins reached 16% last year.

Several managers named a supplier's willingness to take a production-line approach to operations as a prerequisite for the efficient execution of hybrid offerings. This approach comprises three elements, according to our depth interviews: repeatability and economies of scale of hybrid offerings, modularity of service elements within hybrid offerings, and proactive management of delivery costs. In terms of economies of scale, one respondent referred to a manufacturer's understanding of a hybrid offering's life cycle as necessary for achieving economies of scale through standardization:

> When it comes to delivery, services are pretty similar to products. Like products, services move through a maturation process. You need to standardize services to achieve economies of scale. The more standardized the delivery processes, the higher the profit margins. Take the example of our maintenance contracts for medical equipment. Over time, we have learned how to make money with these contracts.

In terms of modularity, participants mentioned the need to build a menu of hybrid offering preconfigurations from which customers could choose to satisfy different demands. Managers finally discussed several approaches to minimizing delivery costs. One manager noted the role of smart technologies, which facilitated first-level maintenance and thus reduced the need to deploy costly field technicians. Another firm invited customers to schedule routine maintenance during periods in which the vendor could better use the idle capacities of its field service organization. Yet another invested in training its customers to perform troubleshooting and simple maintenance tasks themselves. Finally, one company transferred standardized service tasks to its distributor network to achieve cost savings. The managers' discourses thus mirrored the renewed research focus on the productivity imperative (Rust and Huang 2009). Almost 40 years ago, Levitt (1976) urged managers to transfer mass production principles to service operations.

Although standardizing back-office operations and achieving greater levels of productivity can minimize costs, this effort cannot come at the expense of providing customers with the individual offer elements they need. Recent research has suggested that an excessive focus on cost reduction actually reduces service revenue generation (Rust and Huang 2009), which implies that manufacturers must also seek effectiveness through flexibility in their customer interface. Participants in our study noted that their firms used flexible offering platforms to meet diverse customer needs. For example, one company fulfilled customer adaptation needs while maintaining standardization requirements through a set of predefined maintenance contracts:

> We build "service boxes." For example, we offer six different types of maintenance packages for printers in retail banking. In 80% of the cases, the customer fits into one of these boxes. The customer can look at these offers and see which of them matches best his situation.

To develop a hybrid offering deployment capability, manufacturers also needed to invest in more specific resources:

> Take our customer solution offer for in-flight entertainment systems in airplanes. We entered the market with a technically superior product that was well

> received by the market We came into the game from the product side We overemphasized product features but didn't give enough thought to the services airline companies needed Our competitors had a full-fledged solution offer in place So we had no choice [but] to match their offer As we started to deploy our solution, we found that we didn't have the network, the processes, and people in place to make it work Our challenge is to build a system that allows us to deliver on the performance commitments we make, while still maintaining our profit margins You can't build that overnight As we don't have the experience yet, our prices are calculated with a security margin, and that doesn't help a lot to make us look competitive in the market

In focusing too much on product performance, this manufacturer neglected to invest in delivery-specific resources, such as an adequate network, processes, and people, to deploy its complex hybrid offering It thus struggled to meet its performance commitments cost-efficiently

Accordingly, we define service deployment capability as a goods manufacturer's capacity to rely on flexible offering platforms that can standardize hybrid offering production and delivery processes while also safeguarding its ability to adapt to individual customers' needs The resource base for this capability is predominantly the firm's product development and manufacturing assets, as well as its field service organization For expositional clarity and to facilitate comparisons, we summarize the construct definitions and linkages between resources and capabilities in Table 2

Typology of Service Offerings and Positional Advantage

How does the ability to translate key capabilities into performance differ for various types of services in a hybrid offering? Using our interviews, we first develop a new classification of services that manufacturers combine with goods to form hybrid offerings We then discuss how unique resources and distinctive capabilities relate to manufacturers' positional advantage for each category identified in our typology

Marketing literature defines services as "deeds, processes, and performances" (Zeithaml, Bitner, and Gremler 2006, p 4) and as "the application of specialized competences (knowledge and skills) through deeds, processes, and performances for the benefit of another entity or the entity itself" (Vargo and Lusch 2004, p 2) However, services can materialize in very different offerings Thus, to provide a more granular discussion of the effects of resources and capabilities on positional advantage, we need a typology that addresses such heterogeneity

Many classification schemes have been suggested for services, predominantly in a consumer marketing context For example, Lovelock (1983) classifies services according to two fundamental issues at whom (or what) a service act is directed and whether the act is tangible or intangible The classification of industrial services has not received the same level of attention as consumer services, Boyt and Harvey (1997) distinguish three categories—elementary, intermediate, and intricate—according to six service characteristics replacement rate, essentiality, risk level, complexity, personal delivery, and credence properties Frambach, Wels-Lips, and Guendlach (1997) instead use transaction versus relationship services

Our proposed classification of industrial services contains two dimensions and thus identifies four good–service combinations The first dimension refers to whether the service is directed at the supplier's good or the customer's process Our interviews further reveal a second dimension for classifying services in hybrid offerings whether the supplier's service value proposition is grounded in the promise to perform a deed (input-based) or achieve performance (output-based) In combining these two dimensions, we derive four categories that differ fundamentally in the key resources and capabilities needed to deploy hybrid offerings in business markets (Table 3)

Product life cycle services The manufacturers in our sample firmly asserted that they already were in the service business because each firm provides a basic set of core services for business customers For example, the manufacturer of injection molding machines could not sell its equipment without ensuring timely repair and maintenance services Therefore, product life cycle services (PLS) refer to the range of services that facilitate the customer's access to the manufacturer's good and ensure its proper functioning during all stages of its life cycle, whether before, during, or after its sale, such as the delivery of industrial cables to a customer's construction site, installation of a high-voltage circuit breaker, inspection of an ATM, or recycling of a power transformer These services are directly attached to the supplier's good, so the value proposition derives from the most generic definition of service a promise to perform a deed on behalf of the customer For example, if one of its coolant pumps broke down, the nuclear power plant equipment manufacturer promised customers that it would repair the defective pump within a contractually agreed-on time frame

The managers in our study complained that customers typically perceived PLS as a "must have" and displayed low willingness to pay for such services Because they found it difficult to differentiate PLS, managers sought to standardize these basic services However, several managers also explained that PLS played a key role, beyond merely enabling sales, in that they were pivotal in establishing the vendor's reputation as a competent service provider They viewed building trust through PLS as a prerequisite for expanding into adjacent, value-added service categories

Thus, these characteristics had important implications for pricing PLS Respondents explained that their firms were often tempted to give away PLS for free to secure equipment sales or simply invoice customers for time and material, according to a "break it, fix it" logic To avoid the pricing question, several firms bundled goods and services into an "all-inclusive" offer

To succeed in this category, manufacturers were challenged to meet customers' basic expectations in the most cost-efficient manner, using highly standardized services Therefore, a manufacturer's skills in deploying the hybrid offering emerged as the primary distinctive capability required for mastering PLS In addition, design-to-service capabilities allowed them to redesign equipment or components to minimize PLS production and delivery costs

To secure these capabilities, manufacturers in our sample primarily invested resources in their field service organizations In addition, several suppliers had invested in product development and manufacturing assets to contribute to the cost-efficient delivery of PLS

TABLE 2
Summary of Definitions, Examples, and Linkages between Resources and Capabilities

	Definition	Example	Primary Resource Base
Unique Resources			
Installed base product usage and process data	The stock of product usage and customer process data collected through a firm's installed base of goods and/or used in customers' operations	Forklift truck downtime data	—
Product development and manufacturing assets	The stock of resources invested in a firm's R&D and manufacturing infrastructure Product development and manufacturing assets are of tangible and intangible nature	Patented tire casing	—
Product sales force and distribution network	The stock of resources tied in a firm's direct sales organization and channel intermediaries to cover its sales territory	Direct sales force of 600 power tools sales reps	—
Field service organization	The stock of resources allocated to a network of specialized technicians aimed at deploying and servicing the firm's installed base	Network of 110 field technicians servicing offset-printing presses	—
Distinctive Capabilities			
Service-related data processing and interpretation capability	The manufacturer's capacity to analyze and interpret installed base product usage and process data to help customers achieve productivity gains and/or cost reductions	Analysis of energy consumption in commercial buildings based on data collected from electricity meters	Installed base product usage and process data
Execution risk assessment and mitigation capability	The manufacturer's capacity to evaluate the uncertainty whether contractually agreed-upon outcomes will be realized and to design and implement safeguarding mechanisms to meet performance commitments while maintaining internal profit targets	Percentage of correctly operating video screens for inflight entertainment systems in commercial aircrafts	Installed base product usage and process data
Design-to-service capability	The manufacturer's capacity to integrate tangible and intangible offering elements synergistically to tap its potential for new revenue generation and/or cost reduction	Reengineering of a laser printer to reduce potential failures and decrease unscheduled maintenance	Product development and manufacturing assets
Hybrid offering sales capability	The manufacturer's capacity to reach key decision makers in the customer organization, coordinate key contacts in the customer and vendor firms, sell value based on specific documentation and communication tools, and align its sales force with the field organization and channel partners to grow revenues	Dedicated sales force recruited, trained, and incentivized to sell "tons of iron ore transported" instead of promoting "heavy-duty mining equipment"	Product sales force and distribution network
Hybrid offering deployment capability	The manufacturer's capacity to rely on flexible platforms that allow for standardizing production and delivery processes while safeguarding its ability to adapt to individual customers' needs	Configuration of six different printer maintenance packages to cover the needs of retail banking customers	Product development and manufacturing assets field service organization

TABLE 3
Classification Scheme of Industrial Services for Hybrid Offerings

	Service Recipient	
Nature of the Value Proposition	**Service Oriented Toward the Supplier's Good**	**Service Oriented Toward the Customer's Process**
Supplier's promise to perform a deed (input-based)	**1. Product Life-Cycle Services (PLS)** *Definition* •Services to facilitate the customer's access to the supplier's good and ensure its proper functioning during all stages of the life cycle *Examples* •Delivery of industrial cables •Inspection of an ATM machine •Regrooving of an industrial tire •Recycling of a power transformer *Primary Distinctive Capabilities* •Hybrid offering deployment capability •Design-to-service capability *Main Underlying Resources* •Field service organization •Product development and manufacturing assets	**3. Process Support Services (PSS)** *Definition* •Services to assist customers in improving their own business processes *Examples* •Energy efficiency audit for a commercial building •Logistics consulting for material-handling processes in a warehouse *Primary Distinctive Capabilities* •Service-related data processing and interpretation capability •Hybrid offering deployment capability •Hybrid offering sales capability *Main Underlying Resources* •Installed base product usage and process data •Field service organization •Product sales force and distribution network
Supplier's promise to achieve performance (output-based)	**2. Asset Efficiency Services (AES)** *Definition* •Services to achieve productivity gains from assets invested by customers *Examples* •Remote monitoring of a jet engine •Welding robot software customization *Primary Distinctive Capabilities* •Service-related data processing and interpretation capability •Execution risk assessment and mitigation capabilities •Hybrid offering sales capabilities *Main Underlying Resources* •Installed base product usage and process data •Product development and manufacturing assets	**4. Process Delegation Services (PDS)** *Definition* •Services to perform processes on behalf of the customers *Examples* •Tire fleet management on behalf of a trucking company •Gas and chemicals supply management for a semi-conductor manufacturer *Primary Distinctive Capabilities* •Service-related data processing and interpretation capability •Execution risk assessment and mitigation capabilities •Design-to-service capability •Hybrid offering sales capabilities •Hybrid offering deployment capability *Main Underlying Resources* •Installed base product usage and process data •Product development and manufacturing assets •Product sales force and distribution network •Field service organization

Asset efficiency services Respondents explained that their firms actively sought differentiation from competition and to increase beyond generic PLS through new and distinctive value-added services wrapped around their goods Several firms had moved toward asset efficiency services (AES), which we define as the range of services suppliers provide to achieve productivity gains from assets invested by customers The AES companies in our study developed include preemptive maintenance of ball bearings, on-site condition monitoring of an offset printing press, and customization of application software for a welding robot

Similar to PLS, AES are directed toward the supplier's good and rarely are provided as stand-alone services For example, the manufacturer of MRI scanners proposed AES for its own medical equipment only, not for competitors' scanners The comparison of PLS and AES reveals several key differences First, when venturing into AES, firms fundamentally changed their value proposition With PLS, the vendors promised to perform a deed (i e , “we fix the in-flight entertainment system when it breaks"), but with AES, they went one step further and committed to performance related to asset productivity (i.e., "we guarantee availability of 98.5% of video screens up and running in an aircraft"). Second, AES are by far less standardized than PLS and typically allow suppliers to differentiate themselves from competition. For example, power utilities increasingly view high-voltage circuit breakers as a commodity, so by adding a remote monitoring service, the supplier in our sample found a way to enhance its core offer and set itself apart from its main competitors. Third, respondents explained that unlike PLS, AES typically are not considered "must haves" among customers. On the contrary, customers understood that AES went beyond enabling an equipment's basic functioning, acknowledged that AES were sold separately from the vendor's core offer of goods and PLS, and displayed a higher willingness to pay for value-added AES—provided the suppliers could persuasively communicate the potential productivity gains. In their move from PLS to AES, companies in our sample also gradually shifted from cost-based to value-based pricing for these new hybrid offerings.

Asset efficiency services exhibit commonalities with proactive postsales service, a concept Challagalla, Venkatesh, and Kohli (2009) investigate. Two forms of proactive postsales service—proactive prevention and proactive education—directly relate to our notion of AES. According to Challagalla, Venkatesh, and Kohli, proactive prevention "refers to a supplier proactively initiating efforts to detect problems that may be imminent for a customer and taking action to avert them" (p. 74), whereas proactive education "refers to a supplier initiating effort to educate customers on how they can derive greater utility from its products" (p. 76). Our study sheds additional light on these categories by underscoring the key shift in the manufacturer's value proposition and by investigating the key capabilities and resources needed to excel in this domain.

That is, to succeed in AES, manufacturers needed to develop an ability to accurately assess and manage product failure risks. Service-related data processing and interpretation capabilities, as well as execution risk assessment and mitigation capabilities, emerged as particularly relevant skills. In addition, hybrid offering sales capabilities were noted as an important issue for AES because manufacturers had to switch to value-based selling efforts in this domain.

To secure these capabilities for AES, the suppliers in our study invested heavily in installed base product usage and process data, as well as product development and manufacturing assets, to support their failure rate predictions. The aircraft engine manufacturer explained that it was even willing to take unprofitable maintenance contracts as a means to acquire strategic usage data to learn over time and build the capabilities required to succeed in AES.

Process support services. The two previous categories focused on services attached to a supplier's good, but respondents explained that their firms also grew into services directly geared toward their customers' processes. We define process support services (PSS) as the range of services a manufacturer provides to assist customers in improving their own business processes. The PSS that emerged in our research include services such as the industrial gas manufacturer's assessment of welding processes in a customer's automotive plant and the electricity meter manufacturer's energy efficiency audit, designed to improve electricity consumption in a retail store.

Thus, PSS focus on the customer's processes, not the manufacturer's good. Although firms in our sample preferred to provide PSS in conjunction with their own goods, several suppliers also selectively offered PSS, regardless of the equipment. For example, the forklift truck manufacturer offered warehouse optimization and logistics consulting to a customer, without selling its own material handling equipment to that client. Thus, the value proposition focused on leveraging the supplier's specialized competences to help customers optimize processes, or specific process elements, in their operations. In other words, manufacturers committed to performing specific, process-oriented deeds to assist customers in what they had to do. However, they did not take responsibility for customer processes, nor did they conduct the processes on their behalf—two key differences compared with process delegation services, which we discuss in the next section. For example, when analyzing welding processes in a customer's automotive plant, the supplier of industrial gases leveraged its process application skills about the underlying good (i.e., gas used for welding) to assess the customer's process and make recommendations to improve the quality of welded products while also reducing costs, but the customer remained solely in charge of deciding on and implementing process changes. Also, in most cases, the ultimate goal is to open the door for a complete hybrid offering.

The characteristics of PSS suggest they typically are tailored to customer contexts and needs. Because PSS leverage strong product expertise and process application skills, they strongly differentiate the supplier in the market. For example, many industrial gases are considered pure commodities (e.g., hydrogen, oxygen), but the gas manufacturer's unique knowledge about how to apply gases in customers' processes (e.g., food conservation in a meat processing plant) effectively sets the firm apart from competitors.

In turn, for pricing decisions, suppliers found that customers' willingness to pay tended to be high. Managers explained that in general, PSS were priced similar to professional services. Manufacturers billed customers according to the time and resources needed to provide the service. For example, the industrial gas supplier invoiced a certain number of man-hours devoted to auditing a customer's welding process.

To succeed in PSS, manufacturers explained that they had to leverage their service-related data processing and interpretation capabilities to gain intimate knowledge of customer processes. They further referred to hybrid offering deployment capabilities needed to analyze those complex customer processes, develop recommendations for process improvements, and assist and train customer personnel in achieving improvements. In addition, respondents emphasized that PSS require fundamental changes in their firms' sales approach and organization. To sell PSS like professional services, companies needed to grow their hybrid offering sales capabilities. These services required reaching different people in the customer organization and using different sales arguments. In addition, some suppliers mentioned that they had overhauled their go-to-market strategy by moving away from reliance on channel intermediaries and building a more direct sales approach as a way to grow in PSS To secure these capabilities specific to PSS, firms invested in installed base product usage and process data and hired specialized technicians in the field service organization, as well as dedicated sales representatives in the suppliers' sales force

Process delegation services Finally, several firms in our study ventured into a fourth category of hybrid offerings We define process delegation services (PDS) as the range of services a manufacturer provides when it performs processes on behalf of customers Examples include fleet management of professional tires on behalf of a trucking company, fly-by-the-hour agreements for commercial jet engines, and total gas supply management for a semiconductor plant The PDS are directed at the customer process, but unlike input-based PSS, in which customers remain in control, suppliers go one step further in PDS and focus their value proposition on the promise to achieve process performance (i e , output based) The suppliers in our study that offered PDS took charge of and controlled the processes, together with, or on behalf of, their customers Thus, this category captures the most complex type of hybrid offerings

We use the term "process delegation services" rather than customer solutions or outsourcing contracts to capture the overarching logic of these agreements In line with extant literature on solutions, our study confirms the key characteristics of integration and customization in these types of good-service combinations (for an overview of extant literature on solutions, see Tuli, Kohli, and Bharadwaj 2007, pp 3–4) However, our depth interviews suggested some additional distinctive characteristics Overall, we consider six defining aspects of PDS First, suppliers in our sample typically integrated goods and service elements into complex hybrid offerings Second, PDS were highly customized to address customers' specific requirements Third, all agreements in this category required some level of customer involvement, ranging from light levels of information sharing to active cocreation and joint implementation of the PDS agreement For example, the tire company established a dedicated team, composed of members from both the supplier and the customer organizations, to define the content and monitor the execution of its fleet management offering Fourth, and as a consequence, the interests of both parties were strongly aligned in PDS For example, in the fleet management offering, the customer's truck drivers had to be trained and incentivized to avoid "burning rubber on the road," which would reduce contract profitability from the supplier's perspective Fifth, in all the PDS agreements we found, customers required that the suppliers assume some level (or all) of the process outcome risk Risk transfer represents one of the main motivations for customers to enter into such complex agreements Sixth, in line with the notion of risk transfer, the PDS involved complex gain-sharing agreements Managers explained that their firms had to develop, in cooperation with their customers, entirely new sets of key performance indicators that served as the basis for pricing PDS

Our findings illustrate that few suppliers actually venture into PDS, largely because of the very sophisticated capabilities required As Tuli, Kohli, and Bharadwaj (2007) show, suppliers need unique skills to define requirements, customize, integrate, and deploy offers, and provide post-deployment support in such complex arrangements In line with these findings, we show that manufacturers must master all the capabilities and resources identified in our research to succeed in this category of highly complex hybrid offerings Not surprisingly, then, true PDS remain limited in many business markets and often are provided by only the leaders

Impact of Capabilities on Positional Advantage

Superior resources and capabilities enable a firm to execute activities along the value chain, either at a lower cost or in a way that leads to differentiation (Day and Wensley 1988) They facilitate competitive advantages in the form of superior customer value, through the resultant differentiated offering or lower relative cost (Figure 1) Using our identified distinctive service capabilities and typology of services, we propose conditions that determine how a manufacturer's deployment of capabilities affects its positional advantage (Table 4)

Service-related data processing and interpretation capability For PLS, data processing and interpretation skills help manufacturers reduce service delivery costs (costs to serve) rather than representing a unique source of differentiation For example, the industrial gas manufacturer significantly reduced the costs of delivering oxygen cylinders to customers' production sites by better analyzing variations in consumption patterns

With regard to AES, we expect that a supplier's ability to collect, analyze, and interpret strategic product usage and process data enables it to design and sell new value-added services that assist customers in gaining productivity improvements to their assets For example, by remotely monitoring its high-voltage power transformers, a manufacturer assisted power utilities in preventing potential power outages and effectively increased equipment availability Few power utilities collect these data, nor do they have an expert system to analyze, interpret, and operate their power transformers accordingly

For PSS, we expect that a supplier's ability to analyze and interpret product usage and customer process data enable it to design and sell value-added services that assist customers in gaining productivity improvements and cost reductions in their own operations For example, by collecting data on the welding process in an automotive plant, the industrial gas supplier successfully designed and sold welding auditing and consulting services to its customer

Finally, a supplier's ability to analyze product usage and customer process data represents a key prerequisite for taking responsibility for performing processes on behalf of customers For example, by collecting data on how the customer processed extremely pure specialty gases in its semiconductor plant, the gas manufacturer realized a means to take over the supply management of gases and related chemicals and commit to a performance-based contract Without these distinctive customer data skills, it never would have ventured to offer a service in this category

Execution risk assessment and mitigation capability We have distinguished services according to whether a supplier's value proposition is grounded in the promise to perform a deed (input based) or achieve performance (output

TABLE 4
Summary of Proposed Effects of Service Capabilities on Positional Advantage

Service Capability	PLS	AES	PSS	PDS
Service-related data processing and interpretation capability	Cost advantage	Differentiation advantage	Differentiation advantage	Differentiation advantage
Execution risk assessment and mitigation capability	—	Differentiation advantage	—	Differentiation advantage
Design-to-service capability	Cost advantage	Differentiation advantage	Differentiation advantage	Differentiation advantage
Hybrid offering sales capability	Differentiation advantage	Differentiation advantage	Differentiation advantage	Differentiation advantage
Hybrid offering deployment capability	Cost advantage	Cost advantage	Cost advantage	Cost advantage

based). Risk assessment and mitigation capabilities become critical when committing to outcome guarantees. Moreover, a value proposition that guarantees a certain output is compelling to customers because it allows them to outsource (noncore) activities they previous performed internally. If manufacturers have strong risk assessment and mitigation skills, they can differentiate themselves by venturing into performance-based AES and PDS offerings.

Design-to-service capability. A supplier's ability to develop distinctive design-to-service skills, grounded in its core product development and manufacturing resources, affects its positional advantage in two ways: by bringing new hybrid offerings to the market (differentiation) and by redesigning offerings so the manufacturer can achieve delivery cost reductions. Our interviewees indicated that manufacturers often provided PLS at cost, without making it a source of revenue generation. Many customers simply expected these services as part of the overall value proposition; therefore, the primary benefit of design-to-service skills is that they allow the supplier to offer PLS in a more cost-efficient manner.

However, manufacturers use the design-to-service capability to differentiate their hybrid offerings in the remaining service categories. This tendency makes sense from a customer point of view. The three categories represent more complex hybrid offerings (compared with PLS), so the vendor's legitimacy is more important for customer acceptance. For example, Rao, Chandy, and Prabhu (2008) find that innovations based on scientific legitimacy are more likely to succeed. Similarly, the legitimacy of new hybrid offerings is supported by a strong development and physical product heritage earned by manufacturing firms.

Hybrid offering sales capability. A supplier's abilities to develop a sales force that can sell both products and services, motivate frontline employees to contribute by promoting service sales, align its sales efforts with those of channel intermediaries, and invest in service sales documentation and communication tools should contribute to a differentiation advantage. Traditional product-centric companies tend to consider services a "necessary evil" (Reinartz and Ulaga 2008), and product salespeople often are tempted to give away services for free to secure a product sale. For example, sales representatives may offer an extended warranty contract or "throw in" free technical assistance to encourage customers to sign a product purchase order. This lack of willingness or skill to sell services typically translates into forgone revenue opportunities, which is particularly important in the three service types that contain significant service components: AES, PSS, and PDS. Thus, the more salespeople can target key decision makers with complex, hybrid offerings, the better they can communicate the underlying value proposition. The more frontline employees support the sales process, the more likely the firm is to realize business opportunities from the hybrid offering. However, for PLS, the key focus is the ability to charge for a service that previously was provided for free (i.e., "free-to-fee" transition). Thus, the effect of revenue generation is similar to that for AES, PSS, and PDS, but the underlying source is the provision of existing basic services. We expect that for all four categories, a hybrid offering sales capability supports greater differentiation.

Hybrid offering deployment capability. This capability to standardize service production and delivery processes, conditional on the ability to adapt to a customer's usage situations, should affect a supplier's positional advantage through cost containment. The goal is to deliver the value proposition at a minimum cost, which means that firms must achieve repeatability and economies of scale in their service offerings, modularity of service elements, and proactive service delivery cost management. This demand holds equally for all four service categories.

Discussion and Implications

We investigate what goods-based, industrial firms must do to generate successful hybrid offerings and why they should be more successful doing so than pure service players. Despite the business importance of generating and managing service offerings, prior research has provided little satisfactory explanation of the underlying capabilities needed to succeed in this domain. Our findings contribute in three main areas to a better understanding of how organizations can move successfully and profitably toward hybrid offerings.

Our first key contribution is to identify five distinctive capabilities that manufacturers must develop to deploy hybrid offerings. We purposefully did not focus on generating an exhaustive list of generic capabilities per se, rather, we wanted to reflect the specificities of the hybrid offering context. Using the resource-based view, we identified four unique resources that manufacturers are in a powerful position to leverage to build these capabilities. We thus have developed a comprehensive framework that integrates capabilities and resources in a consistent manner to explain success in hybrid offering development. Second, we have accounted for the heterogeneity of services by developing a new classification of the industrial services that manufacturers combine with goods to form hybrid offerings. Without this typology, the analysis would be simplistic and overly general. Third, we have used our typology to propose effects of the unique capabilities on organizations' positional advantage. Specifically, we analyzed whether the identified capabilities create a differentiation advantage or a cost advantage. Our findings lead to a set of implications for theory and practice.

Implications for Theory

Our study offers three new, important implications for academic inquiries in service domains. First, most previous studies have taken a dichotomized view of goods versus services. As a result, recommendations for capabilities have revolved around the service properties of intangibility, perishability, and inseparability (Bharadwaj, Varadarajan, and Fahy 1993). We adopt a different perspective, because in a large offering space, sellers combine meaningful goods and service components into hybrid offerings—a view inconsistent with a dichotomous perspective. Thus, we needed a different approach that recognizes the transition of a goods manufacturer into a hybrid offerer. We highlight the five distinctive capabilities required for such a transition and identify unique facets for each. For example, prior research has not investigated which specific sales skills are needed for selling hybrid offerings. Second, previous research has highlighted the importance of transitioning toward a greater service component (Fang, Palmatier, and Steenkamp 2008), we consider how this transition might occur. Manufacturers may enjoy a very powerful position from which to transition toward hybrid offerings, and we outline existing resources that could provide them with excellent leverage when they start to develop hybrid offerings. Because the move into hybrid offerings is typically gradual (e.g., PLS followed by AES), our findings help identify trajectories for the transition process, a new effort that has not been undertaken previously. Third, most service literature emphasizes the potential of services to improve profitability through greater differentiation and thus satisfaction, loyalty, and willingness to pay (Fornell, Rust, and Dekimpe 2010). We argue that in many situations, manufacturers increase their hybrid offering profitability through a cost advantage route as well. In specific capability–service combinations, manufacturers are particularly well positioned to unlock that potential. Thus, we add a new perspective to prevailing views on positional advantage in services. These combined implications are both new and important to services literature and complement existing findings about successful service strategies.

Implications for Practice

Our findings provide insights into the factors that drive success when venturing into value-added combinations of goods and services. Managers can use our resource–capability framework as a guideline for how to change their existing practices for selling hybrid offerings. We proceed by presenting our implications related to each of the four resource bases while simultaneously drawing on the respective capability linkages. Thus, our study identifies those unique resources and distinctive capabilities that manufacturers must recognize, secure, and grow to succeed in hybrid offerings.

First, our experience working with manufacturers reveals that many suppliers still fail to (1) recognize the strategic nature of their installed base data, (2) invest enough in smart technologies to collect data systematically, or (3) leverage the full potential of available data for differentiation and/or cost reduction. Manufacturers must develop new and innovative skills to make sense of their data, and suppliers in turn should take specific steps to protect access to this strategic asset, such as by redesigning components and equipment in such a way to effectively keep pure service players at bay. Execution risk assessment and mitigation skills also flow from this strategic asset. Every dollar invested in these specific capabilities allows a firm to set itself further apart from its competition. Second, (re)designing goods (with hybrid offerings in mind) would enable the manufacturer to not only protect access but also leverage its product development and manufacturing assets to improve hybrid offerings—a skill still woefully underdeveloped in manufacturing firms. The innovation processes of leading manufacturers in our research show that many modern firms do not "think service" from the outset, have not sensitized or trained their product development staff, and do not include a service imperative as a key objective in their innovation specifications. However, unlike pure service players, manufacturers have privileged access to the key physical elements of hybrid offerings, they can best influence and shape the way physical features synergistically interact with service elements. Thus, our results suggest that to build distinctive design-to-service skills, firms should take a fresh look at their internal innovation processes and structures, which is a promising route toward differentiation and cost improvements compared with third-party service providers. Third, manufacturers' sales forces and close-knit distributor networks provide them with privileged access to key contacts in customer organizations. Even if they already have "a foot in the door," building the specific sales capabilities needed to sell hybrid offerings still represents a formidable challenge for suppliers. As one manager explained, "We found that one-third of our sales people easily switch to selling services in addition to goods. We just have to provide them with the tools. One-third of our sales guys need heavy training and a lot of holding hands to get there. And then, there's one-third, [pauses] well, they're just not getting there." Manufacturers should take a hard look at their current portfolio of salespeople and distributors and decide how to best (re)allocate these resources to goods and/or hybrid offering sales. Finally, our findings offer similar suggestions with respect to the manufacturer's field service organization Field technicians can make or break the successful deployment and enable sales of hybrid offering in terms of both differentiation and cost containment

Taken together, these challenges in securing unique resources and distinctive skills explain why many manufacturers wrestle with cultural issues when they attempt to transition toward hybrid offering sales Introducing service elements into traditional goods-dominant offerings requires strategic change management, led from the top From this perspective, our research indicates that a manufacturer's general management must take the lead in securing the resources and building the capabilities we have identified A firm commitment from top management is an indispensable condition for a successful growth strategy in hybrid offerings Executives can cast the resources and capabilities, together with the very detailed facets of these elements we have identified, in a managerial scorecard to assess the current strengths and weaknesses of their organization and carve a path to growth in hybrid offerings

Beyond identifying a manufacturer's current status and needs, our findings allow managers to take a close look at their existing portfolio of offerings and make strategic decisions that allow the mix of hybrid offerings to evolve over time From our ongoing work with two industrial equipment suppliers, we have learned that our proposed classification lends itself to discussing potential trajectories In our study, companies typically grew from PLS into AES and PSS Only half the firms in our sample gradually shifted into PDS, after they consolidated their positions in the other three categories Thus, our typology enables managers to investigate the resources and capabilities needed in each category and understand how those capabilities relate to differentiation and cost advantages in the four service types

Limitations and Further Research Directions

As is the case for any research project, our study choices created some limitations, some of which offer fruitful avenues for research A natural next step would be an empirical validation to quantify the proposed effects In addition, our 22 interviewees all provided a vendor perspective It would be helpful to triangulate their perceptions with actual customer data Scholars could also investigate how pure services firms venture into hybrid offerings and compare their resources and capabilities with our results This extension would provide a noteworthy contrast and reveal the advantages and disadvantages of expanding into a hybrid market space from either side Although these limitations must be kept in mind when considering our results and implications, we hope our findings provide new insights to academics and practitioners alike

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Irit Nitzan & Barak Libai

Social Effects on Customer Retention

This study explores the role of customers' social network in their defection from a service provider The authors use data on communication among one million customers of a cellular company to create a large-scale social system composed of customers' individual social networks The study's results indicate that exposure to a defecting neighbor is associated with an increase of 80% in the defection hazard, after controlling for a host of social, personal, and purchase-related variables This effect is comparable in both magnitude and nature to social effects observed in the highly researched case of product adoption The extent of social influence on retention decays exponentially over time, and the likelihood of defection is affected by tie strength and homophily with defecting neighbors and by these neighbors' average number of connections Highly connected customers are more affected, and loyal customers are less affected by defections that occur in their social networks These results carry important implications for the theoretical understanding of the drivers of customer retention and should be considered by firms that aim to predict and affect customer retention

Keywords customer retention, social networks

It has been acknowledged for some time that the adoption of new behaviors or innovations may be substantially affected by social interactions with others (Rogers 2003, Ryan and Gross 1943) Across several disciplines, there is a growing realization that quitting behavior may be socially affected as well For example, researchers have shown that people are socially affected by others, sometimes to a large degree, in cases of quitting smoking (Christakis and Fowler 2008), defecting from military service (De Paula 2009), or leaving employment in a firm (Castilla 2005)

Marketers should be interested in this phenomenon because of its possible implications for understanding and predicting customer retention Over the past two decades, practitioners and academics have paid considerable attention to customer retention and to its antecedents and consequences, primarily because of the impact of retention on customer lifetime value and consequently on the firm's bottom line (Bolton 1998, Rust and Chung 2006, Verhoef 2003, Villanueva and Hanssens 2007) However, almost all marketing-related analysis on social effects among customers has focused on customer acquisition, and particularly on the adoption of new products, rather than on customer retention

Here, we present a first-of-its-kind analysis of the effects of social environment on customer retention In this analysis, we use a database of more than one million customers of a cellular company in a Mediterranean country Researchers are increasingly using telecommunications databases to explore social network behavior (Hill, Provost, and Volinsky 2006, Onnela et al 2007), and recent studies suggest that cellular networks serve as a good proxy for real social networks (Eagle, Pentland, and Lazer 2009) Using data on the communication among customers, we were able to create a large-scale social system composed of customers' social networks Because our social system includes all the personal customers of the company rather than a sample, we avoid the nontrivial problems associated with network-related analysis based on sampling from large-scale networks (Monge and Contractor 2003)

We combine social network information with data on customer retention to assess the extent to which a customer who leaves the company might be affected by the past defections of other members in his or her direct personal social network (whom we label "neighbors")

We estimate two proportional hazard models a traditional model, which takes into account customer satisfaction, usage patterns and demographics (Bolton 1998, Bolton and Lemon 1999), and a social model, which includes, in addition to the variables of the traditional model, the social aspects that may drive customers' defections (e g , exposure to a defecting neighbor, the size and characteristics of each customer's social network) We can summarize our results as follows

- *The extent of the social effect* We find that the social aspects we evaluate have a sizeable impact on defection and that the inclusion of social variables increases the explaining power and predictive power of the customer defection model For example, when controlling for a host of personal, satisfaction-related, purchase-related, and social variables, we observe

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that a neighbor's defection is associated with an increase in the hazard of a focal customer's defection of approximately 80% This effect is comparable to and even higher than most reported effects in the domain of adoption, and it holds when the level of advertising by various competitors is taken into account

- *The nature of the social effect* We determine that the pattern of social effects on customer defection is consistent with reported patterns related to adoption, which suggests that defection and adoption are driven by similar mechanisms We observe that the hazard of defection increases with tie strength with defecting neighbors and with homophily with defecting neighbors, and it decays exponentially with time Furthermore, we observe that customers with greater numbers of social connections are more likely to defect, a similar phenomenon is observed in the case of adoption, in which highly connected "network hubs" adopt earlier (Goldenberg et al 2009) Regarding customers who affect others, we find that highly connected customers might affect others more weakly than customers with fewer connections A customer's hazard of defection decreases as the average degree of his or her defecting neighbors increases Moreover, we find that customer loyalty may help "immunize" customers against the effect of the defection of others Heavy users and customers with higher tenure are less affected by neighbors' defections than light users and newer customers, respectively

Our findings contribute to current literature in several ways First, they underscore the need to further study the social aspects of customer retention They suggest that the tools and mechanisms used to study social effects on customer acquisition can be used to study the social effects on their retention From a practical aspect, our work sheds light on the need to incorporate social effects into the widely used churn-prediction models (Neslin et al 2006), which have historically ignored intercustomer dynamics Second, these findings contribute to knowledge on the drivers and consequences of customer loyalty, and from a social effects perspective, they provide further insight into the contribution of customer loyalty to the bottom line Third, these results highlight the need to formally examine various social effects and provide relatively rare empirical evidence of how social effects among customers decay over time Finally, we demonstrate how large-scale telecommunications databases can be used to supply researchers with a rich platform that enables them to study actual consumption behavior over time in the presence of social effects

Background

Traditional Retention Drivers

The importance of customer retention stems mainly from its close connection to a firm's bottom line (Reinartz and Kumar 2003, Rust and Chung 2006), retention typically serves as a mediator in the satisfaction–profitability link (Rust, Lemon, and Zeithaml 2004, Villanueva and Hanssens 2007) Although there is a debate as to the precise mechanisms of the relationship between retention and profit, in general, researchers agree on the importance of retention as a key driver of a firm's profitability, and it is repeatedly treated as a critical component in customer profitability models (Bolton, Lemon, and Verhoef 2004, Gupta et al 2006) This perspective is reflected in the considerable attention that firms devote to building predictive models of customer churn (Neslin et al 2006)

Numerous studies have attempted to examine retention drivers (Gustafsson, Johnson, and Roos 2005, Lemon, Barnett-White, and Winer 2002, Rust and Chung 2006, Verhoef 2003, Villanueva and Hanssens 2007) Several drivers of retention emerge as especially prominent, we elaborate on these in the following paragraphs

Customer satisfaction serves as a key element in customers' defection decisions (Bolton 1998, Oliver 2009) Researchers have either explored satisfaction at a single point in time (Gustafsson, Johnson, and Roos 2005, Mittal and Kamakura 2001) or considered it a measure that evolves over time (Bolton and Lemon 1999, Bolton, Lemon, and Bramlett 2006, Cooil et al 2007), and they have evaluated satisfaction either on the basis of customers' self-reports or by making inferences from customer behavior

Usage pattern, also considered a consequence of customers' fairness perception (Bolton and Lemon 1999), is typically analyzed as a trend in customers' usage, suggesting that a decrease in customers' usage levels may serve as a key signal of their eventual defection Related findings indicate that low usage levels, which may also be represented by share of wallet (Verhoef 2003), are positively related to customers' likelihood of remaining with the firm (Reinartz and Kumar 2003) *Customer tenure* with the company has been found to negatively affect customers' intentions to defect (Bolton 1998, Cooil et al 2007) and to further enhance the positive effect of satisfaction on customer retention (Verhoef 2003) *Personal characteristics* (Bolton 1998), such as customers' gender (Cooil et al 2007, Mittal and Kamakura 2001) and age (Baumann, Burton, and Alliott 2005), have been found to significantly affect customers' defection decisions in various industries including financial services, communication services and the auto industry

In light of these efforts, the absence of research on social influence as a defection driver is evident, especially given strong findings from the diffusion-of-innovation literature, in which social influence has been established to have a notable effect on a consumer's adoption decision (Keller and Berry 2003, Peres, Muller, and Mahajan 2010, Rogers 2003, Van den Bulte and Wuyts 2007)

Retention and Social Influences

Social influence stems from the transmission of various pieces of information among people who are connected to one another This transmission can occur through a variety of interactions a person has with others in his or her social circle For example, a person may receive information about a product by behavioral learning (e g , seeing another person with the product, talking to another person about the product (word of mouth), receiving third-party information about another person who uses the product) Social influence can occur through the transmission of information that reduces uncertainty and search effort, through normative and social pressure, or as a result of network externalities (Peres, Muller, and Mahajan 2010, Van den Bulte and Lilien 2001)

It is not a priori clear whether the extent of social influence on customer defection is similar to that on adoption In contrast to the case of adoption, potential defectors have gained their own knowledge about the brand and may not need to rely so much on others For example, consider the cellular services industry, which we study here By 2008, when this empirical study took place, the industry was mature and the value of risk reduction that social influence had supplied in previous years had probably decreased substantially It could be argued that currently, because customers are relatively knowledgeable of the industry, their defection decisions might be affected by the level of service they experience, the switching costs stipulated in their contracts, and promotions by other companies

In contrast, defections are often associated with negative word of mouth that drives further defections (Wangenheim 2005) It is widely accepted that negative word of mouth has a relatively stronger effect than positive word of mouth (Goldenberg et al 2007, Nam, Manchanda, and Chintagunta 2010) Furthermore, consumers may notice and discuss other people's defections, and this might serve to legitimize planned defections that have not taken place yet Indeed, results regarding social influence on behavior termination in non-brand-related actions such as quitting smoking (Christakis and Fowler 2009) also support possibly sizeable social effects on defections Thus, our first aim is to assess the extent to which customer defections have social effects on the defection decisions of others

We focus on a person's close social network, this network often plays a major role in a consumer's purchase decisions (Godes and Mayzlin 2004, Van den Bulte and Wuyts 2007) One of the challenges associated with such an investigation is that people in the same social network may be affected by unobserved correlations that will drive them to defect at approximately the same time regardless of the social connection (Manski 2000) Therefore, we must take into account data on social network members, their attributes, and their usage patterns when aiming to identify social effects Here we control for a host of variables that include satisfaction, usage pattern, tenure with the provider, and demographics

Our second aim is to portray the nature of the social effects on retention Because the mechanisms of social effects have been studied extensively in the context of adoption of innovations, it is of interest to explore whether the same mechanisms operate in the case of retention or whether we need to update our knowledge on social effects in this respect Specifically, we investigate tie strength, homophily, degree of connectivity, and the effect of time We elaborate on each factor in the following subsections

Tie strength Prior adoption-related studies have indicated that consumers may be more affected by people with whom they have closer relationships (Brown and Reingen 1987) Thus, a closer relationship, as perceived by the focal customer, may also have a stronger effect on the customer's defection decision The strength of tie may signify the intensity and tightness of a social relationship (Van den Bulte and Wuyts 2007), and researchers have found it to influence referral behavior among social contacts (Brown and Reingen 1987, Ryu and Feick 2007) Relationships may range from strong, primary relationships, such as a spouse or close friend, to weak, secondary relationships, such as seldom-contacted acquaintances (Reingen and Kernan 1986) In the context of customers' exposure to defecting neighbors, we determine the extent to which the strength of a focal customer's social ties with defecting neighbors contributes to that customer's defection probability

Homophily In the context of adoption, researchers have suggested that referral behavior often takes place among actors (customers) who are similar to one another in beliefs, education, and occupation (Brown and Reingen 1987, Rogers 2003) This tendency may stem from the notion that customers are more likely to trust the endorsements of people whose preferences they share and, conversely, that endorsers are likely to feel more comfortable sharing experiences with people who are similar to them (Feick and Higie 1992) The measure of homophily reflects the level of similarity between two people who take part in a social tie, that is, how alike they are with respect to their personal attributes We investigate the extent to which such similarity between a focal customer and a defecting neighbor affects the focal customer's defection decision

Degree of connectivity Probably the most commonly used measure of centrality in networks, degree centrality represents the connectivity of a person in the network (Monge and Contractor 2003) The degree of a social entity is defined as the number of other entities directly related to that entity, which in our case is reflected in the number of direct neighbors of the focal customer Highly connected customers are typically considered to have the opportunity to affect others' behavior (Barabasi 2003, Van den Bulte and Wuyts 2007) Furthermore, people with numerous connections might also be more strongly affected by the behavior of others For example, Goldenberg et al (2009) suggest that network hubs adopt earlier because of their connectivity If this is the case in defection decisions as well, we may expect that customers with more connections will defect early (i e , have a greater hazard of defection) In contrast, if we consider attention a limited resource, a customer with a greater number of connections may devote, on average, less attention to each connection (Katona, Zubcsek, and Sarvary 2011) As a result, a customer with more connections might actually have a weaker effect on the defection decisions of others We explore two aspects of connectivity to determine its effect on a customer's hazard to defect First, we investigate whether a focal customer with higher connectivity is more likely to defect (similarly to the case of adoption) Second, we examine the effect of the average degree of the defecting neighbors the focal customer was exposed to in a given month

The effect of time An interesting question is related to the possible temporal aspect of social effects on retention In the adoption literature, there are some indications that the effect of word of mouth decays exponentially over time (Strang and Tuma 1993, Trusov, Bucklin, and Pauwels 2009) Here, we consider two events of interest—a neighbor's previous defection and the customer's current one—to determine whether, as in the case of adoption, the social effect of a defection event decays exponentially over time

Data

We carry out our investigation in the context of the cellular industry We focus on this industry because of the availability of customer network data and also because cellular markets have been widely researched in terms of both adoption and churn. Regarding adoption, it is widely accepted that social effects play a role in the diffusion of products in this category (Libai, Muller, and Peres 2009; Manchanda, Xie, and Youn 2008). While churn in this industry is a key managerial variable, historically applied churn models have not incorporated social network aspects.

Our data come from the cellular phone industry in a Mediterranean country in 2008. In that year, there were three main competitors in the market. The market was mature and saturated, so attrition would most likely be reflected in a defection to a competitor rather than abandonment of cellular service. The coverage in this country is considered exceptional, and there are practically no uncovered areas; therefore, we can assume that across geographical areas, the customers of this provider experienced the same level of service. To protect customers' privacy, each phone number was encrypted in a way that still enabled us to track that number through the entire research data set. Payments in this country are for outgoing calls only, and the monthly bill is based on actual minutes of use (MOU) and not on prepurchased minute blocks.

The cellular communication industry has historically been characterized by a pricing-driven network effect (Farrel and Klemperer 2007). In practice, providers have generated this effect by offering subscribers cheaper rates for calls within a specific provider's network. According to interviews conducted with managers of the cellular firm that supplied the data, although out-of-network differential pricing was more common in the past, by the beginning of 2008, more than 80% of the customers belonged to plans in which there was no differential pricing among networks. In the following section, we delineate the data sets used in this study.

Communication Data Set

The communication data set includes information on the communication behavior of all personal customers of a cellular provider in this country (approximately 1.1 million customers); this behavior was tracked over the course of 2008. The research focuses on personal, postpaid customers (85% of personal users in this market). Owing to the challenges associated with identifying a complete relevant network in large-scale networks, most studies in the literature have examined social processes using samples of such networks. However, researchers have recommended avoiding social network sampling when possible (Monge and Contractor 2003), as it may introduce errors and biases (Barrot et al. 2008). Fortunately, we had access to the entire communication database of the cellular provider, which enabled us to construct a complete social network and identify all the network neighbors (i.e., direct contacts) of every customer. We did not have access to detailed communication beyond the provider's network; however, the total MOU and the number of text messages are captured.

Consistent with Onnela et al. (2007), we used three months of data on communication between customers to reconstruct each customer's social network within the provider's network. This is the base map, and it is composed of communication data from January to March 2008. The ties within this network are described in an undirected way (i.e., "A called B" is grouped together with "B called A") because we are not interested in the initiator of the calls but rather in the existence of the link and the volume of communication conducted by the two parties.

The customers in the database conducted 49.6 million calls and exchanged 12.7 million text messages within the provider's network during a typical month. These communication interactions are represented in a network that has an average degree of 12.1 and contains approximately 14 million links (representing communication conducted between the customers in the network). The network's clustering coefficient, which represents the clustering level of the social network, is .17, which is generally consistent with observations for reported social networks.

Satisfaction Data Set

Because of the large number of customers in this data set, it is impractical to obtain a direct, stated measurement of each customer's satisfaction. Therefore, we used two measures to represent customer satisfaction. The first, following Bolton and Lemon (1999), is customer usage trends; we rely on the notion that a decrease in a customer's usage level over time may indicate dissatisfaction. The second is the number of service records documented in each customer's file, as captured from the firm's database. Whenever a customer contacts the service provider (through either the company's call center or its physical service centers), a customer service representative documents the request. Complicated issues require longer documentation, which may consist of several service records. Thus, the quantity of a customer's complaints and recurring questions are reflected in the number of such records, which can be used as a proxy for the customer's satisfaction level. We calculated both satisfaction measures on a monthly basis.

Demographics

We also had access to four sociodemographic characteristics of the provider's customers: gender, age, segment, and socioeconomic status (taken from a zip code database), as well as information regarding the date on which the customers joined the provider's service (and thus their tenure).

Defections Data Set

We capture every defection that occurred among the customers in the database throughout 2008, according to the exact date of defection. To determine a defection, we used the following criteria: Either the customer announced the defection, or it was determined according to the provider's definition of a defecting customer, which is consistent with industry standards (i.e., the customer has not used the phone for six months for either incoming or outgoing calls or for any other purpose). Some network externality effects in the context of the cellular industry may be attributed to family plans in which a family gets a lower rate for within-family calls. Thus, in our case, when members of a family move to another supplier at the same time, we count it as one defection.

With regard to the extent to which customers were exposed to their neighbors' defections, we find that most customers (66.0%) in our data set were not exposed to any defecting neighbors in their immediate networks in 2008; approximately 22% of the customers were exposed to one neighbor who defected, 7.8% were exposed to two neighbors who defected, and the rest (approximately 4%) were exposed to three or more defecting neighbors in 2008 (see Figure W1 in Part A of the Web Appendix at http //www marketingpower com/jmnov11)

Methodology

Survival analysis techniques are widely used in marketing to study various event occurrences related to the duration of consumption behavior (Helsen and Schmittlein 1993, Landsman and Givon 2010) We use a proportional hazard model (Kleinbaum and Klein 2005), a technique researchers frequently use to model the duration of the customer–provider relationship as well as the probability of a customer's ending it (Bowman 2004) There are two important advantages of this method over standard regression methods such as ordinary least-squares or logistic regression First, the proportional hazard model takes into account right censoring (In our case, only 4 1% of the customers churned in the year analyzed, so right-censoring is an issue to consider) This is of particular importance because right-censoring can deceive researchers into finding evidence for contagion when there is none (Van den Bulte and Iyengar 2011) Second, it has the capacity to analyze both time-constant independent variables (e g , demography) and time-varying independent variables Variables such as exposure to defectors can change over time, so this is an essential advantage in our case

In our model, the dependent variable is the hazard of defection A customer who has defected is considered lost for good, this assumption is reasonable given the post-paid contractual nature of the industry studied, as well as the limited time frame we use As in De Paula (2009), we evaluate monthly time-discrete data, which we use to approximate a continuous-time process We tested the hazard proportionality assumption using the Kaplan-Meier curves for each covariate and found that it fits well The issue of left-censoring should also be considered here because customers joined the service at different times We take this issue into account by incorporating each customer's tenure with the service provider (the number of months that passed from the customer's enrollment until January 2008) into the model (Allison 1995)

In the semiparametric partial likelihood estimation we use, the hazard rate $h_i(t \mid x_{it})$ represents the hazard of customer i, whose individual characteristics are captured by vector x_{it}, of defecting at time t, and it is assumed to take the following form $h_i(t \mid x_{it}) = h_0(t)\exp(\beta' x_{it})$, where $h_0(t)$ is the baseline hazard function, which captures the longitudinal effect, and β' represents the effect of the variables composing x_{it} on the hazard rate This estimation enables us to assess the parameters of interest without specifying the baseline hazard $h_0(t)$ In large samples (as in this study), the estimates produced by this approach are consistent and asymptotically normal (Allison 1995)

Variables

Social Variables

Exposure The exposure variable represents the presence of previous defectors in the social system of a defector As we noted previously, we refer to immediate (first-degree) social system members as neighbors We consider exposure to defecting neighbors a time-varying variable and define the exposure of customer i in month t as the following sum

$$\text{Exposure}_{i,t} = \sum_{j \in SN_i} \delta_{j,t},$$

where j denotes a customer who belongs to customer i's immediate social network (SN_i) (i e , j is a neighbor of i), and $\delta_{j,t}$ is a binary variable serving as a flag, which takes a value of 1 if customer j defected in month t and 0 if otherwise

In addition to the basic exposure, we examine the lagged exposure, which reflects focal customer i's exposure to defecting neighbors at several points in time (e g , exposure to defecting neighbors in the current period, exposure to defecting neighbors in the previous period, and exposure to defecting customers two periods ago)

Tie strength Following previous studies (e g , Onnela et al 2007), we used the volume of communication between each pair of customers as an indicator of the strength of the tie between those customers We define customers' communication volume for each pair of customers, and it refers to the sum of minutes these customers spent talking (conversations initiated by either of them) and the number of text messages they exchanged We consider a text message equivalent to one minute of talk We calculate the tie strength (TS) between customer i and customer j, from i's perspective, as follows

$$TS_{i,j} = \frac{\text{Comm\_Vol}_{i,j}}{\text{Total\_Comm}_i},$$

where $\text{Comm\_Vol}_{i,j}$ represents the communication volume between the focal customer (i) and his or her neighbor j ($j \in SN_i$, i e , j belongs to the social network of i) and Total_Comm_i is the total volume of communication that i conducted within the network

We use the individual-level tie strength to calculate the average tie strength with defecting neighbors (avgTS) For each focal customer i in month t, we calculated avgTS as follows

$$\text{avgTS}_{i,t} = \frac{\sum_{j \in SN_i} TS_{i,j} \times \delta_{j,t}}{\sum_{j \in SN_i} \delta_{j,t}},$$

where, as mentioned previously, $\delta_{j,t}$ is a binary variable (0 or 1) that reflects a previous defection of a member of i's social network in month t If $\sum_{j \in SN_i} \delta_{j,t} = 0$, then $\text{avgTS}_{i,t} = 0$

Homophily Following Brown and Reingen (1987), we measured customers' homophily as the percentage of similar characteristics a pair of connected customers share There are four sociodemographic characteristics in our data (gender, age, segment, and socioeconomic status) To evaluate the homophily between any two customers, we assigned a score of 25 points for each variable that was similar between the two customers, and the final homophily score was the sum of these points Thus, homophily between two customers could range from 0 (no match) to 1 (full match) We used binary variables (match/no match) to indicate similarity of gender, segment, and socioeconomic status and determined ages to be similar if the difference between them was less than five years

Similar to the case of tie strength, we calculated each customer's average homophily with defecting neighbors (avgH) For each focal customer i in month t, we calculated avgH as follows

$$avgH_{i,t} = \frac{\sum_{j \in SN_i} H_{i,j} \times \delta_{j,t}}{\sum_{j \in SN_i} \delta_{j,t}},$$

where, as mentioned previously, customer j is a neighbor of customer i ($j \in SN_i$) and $\delta_{j,t}$ is a binary variable (0 or 1) that reflects whether customer j defected in month t If $\sum_{j \in SN_i} \delta_{j,t} = 0$, then $avgH_{i,t} = 0$ The term $H_{i,j}$ represents the level of homophily between the focal customer i and neighbor j

Degree Each customer's total degree within the network represents the number of unique persons with whom this customer communicated during the first three months of data (January–March 2008) We refer to these customers as the neighbors of the focal customer

We also consider the degree of the defecting neighbors to whom the focal customer was exposed We calculate the average degree of defecting neighbors ($avgDEG_{i,t}$) for each focal customer i in month t as follows

$$avgDEG_{i,t} = \frac{\sum_{j \in SN_i} DEG_j \times \delta_{j,t}}{\sum_{j \in SN_i} \delta_{j,t}},$$

where the term DEG_j represents the degree of neighbor j

Satisfaction-Related Variables

We use two satisfaction-related variables change in the level of usage and the number of service records Previous research has suggested that change in use may indicate dissatisfaction (e g , due to equity perception, Bolton and Lemon 1999) To avoid scale differences among customers as well as bias caused by fluctuations in customers' usage levels over time, we refer to the proportion of the current month's usage level ($Use_{i,t}$) to the average usage in the three months preceding that month

$$\Delta Use_{i,t} = \frac{Use_{i,t}}{average(Use_{i,t-1}, Use_{i,t-2}, Use_{i,t-3})}$$

We captured the second satisfaction-related variable, total number of service records in each customer's file, documented by service representatives of the company, on a monthly basis

Economic Incentive

Although 80% of the customers at the time of the study were not charged differential prices for out-of-network calls, such pricing did apply to some customers In addition, one could wonder if some customers might have perceived such a difference because they had been exposed to such pricing plans in the past Thus, it is useful to determine whether part of the social effect can be attributed to network effects However, separating word-of-mouth effects from network externalities continues to be a challenging task for researchers (Goldenberg, Libai, and Muller 2010, Van den Bulte and Stremersch 2004)

To help us understand the influence of network externalities, we include in the model a control variable that reflects the possible economic considerations of a given customer The idea is to separate a customer's communication pattern into within-network versus out-of-network communication The ratio of the within-network communication, measured in monthly MOU, denoted Within_Network_MOU, to the total MOU (within network + out of network, denoted Total_MOU) is a variable we label economic incentive (EI)

$$EI_i = \frac{Within\_Network\_MOU_i}{Total\_MOU_i}$$

We expect that an increase in the EI value for a given customer will be associated with a decrease in the hazard of defection because a neighbor's defection will result in a greater economic loss to that customer (network externalities)

Other Variables

In addition to the variables mentioned previously, we included in the hazard model the control variables that were available to us These include usage, tenure (time with the supplier), age, gender, and membership in several sociodemographic segments as identified by the supplier Tables W1, W2, and W3 in Part A of the Web Appendix (http //www marketingpower com/jmnov11) provide more information about the variables used in this study

The Defection Hazard Model

We estimate three models to examine the social effects of defections Model 1, the *traditional model*, tests the effects of previously explored variables found to affect consumers' tendency to defect[1] These variables include satisfaction, represented by the level of service consumption (service records) and the usage trend, economic incentive, and some demographic characteristics

$$(1) \quad h_i(t \mid x_{it}) = f(ServiceRec_{i,t}, \Delta Use_{i,t}, avgEI_i, avgUsage_i, Tenure_i, Demography_i)$$

Model 2, the *social model*, adds five social variables to the variables estimated in the traditional model to account for the social aspects in the defection process We test the effects of the following on a given customer's hazard of defection the customer's exposure to defecting neighbors, tie strength between the customer and defecting neighbors, homophily between the customer and defecting neighbors, the average degree of the customer's defecting neighbors, and the customer's social connectivity (degree) in the network

$$(2) \quad h_i(t \mid x_{it}) = f(Exposure_{i,t}, avgTS_{i,t}, avgH_{i,t}, avgDEG_{i,t}, Degree_i, ServiceRec_{i,t}, \Delta Use_{i,t}, avgEI_i, avgUsage_i, Tenure_i, Demography_i)$$

Model 3 is aimed at demonstrating the effect of exposure to a defecting neighbor over time, therefore, we incorporated several lagged-exposure variables into this

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[1] We thank an anonymous reviewer for suggesting this approach

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model Exposure_{t-1} represents the exposure to defecting neighbors whose defections occurred in the period (month) before month t, Exposure_{t-2} is the exposure to defecting neighbors whose defections occurred two periods before month t, and so on. Note that to highlight this effect, we focus on the incremental effect of the focal customer's exposure to defecting neighbors in various time gaps while controlling for the basic control variables introduced previously.

$$(3)\qquad h_i(t \mid x_{it}) = f(\text{Exposure}_{i,t}, \text{Exposure}_{i,t-1}, \text{Exposure}_{i,t-2}, \text{Exposure}_{i,t-3}, \text{Exposure}_{i,t-4}, \text{avgEI}_i, \text{avgUsage}_i, \text{Tenure}_i, \text{Demography}_i)$$

Identification

The attempt to infer social influence from observational data raises questions of identification (Hartmann et al. 2008; Manski 2000). Such social influences are sometimes referred to as peer effects. It can be argued that social neighbors (peers) might defect at roughly the same time, not as a result of informational or economic social influence, but rather due to other reasons, referred to in the literature as unobserved correlations. Next, we specify how we attempted to mitigate the possible biases.

Unobserved similarities in customers' preferences and tastes. Product adoption (or defection) similarities may reflect customers' intrinsic tendency to behave similarly (Barrot et al. 2008; Manski 2000). To account for such possibilities, past models have incorporated variables that might indicate similarity, such as demographics (Barrot et al. 2008; Nair, Manchanda, and Bhatia 2010). We included several demographic variables (e.g., gender, sociodemographic group) and usage characteristics (e.g., usage level) of our customers to account for possible intrinsic similarities in taste.

Simultaneity or reflection. In the case of simultaneity or reflection (Manski 1993), a neighbor's defection affects the focal customer's defection, and at the same time the focal customer's defection affects the neighbor's defection. Following Barrot et al. (2008), we confront this problem as follows: First, we use the exact dates of defections. For modeling purposes, we aggregate the data to the monthly level, but we consider a customer's exposure to defection only if the neighbor's defection occurred before the focal customer's defection (at a daily resolution). Second, we use several lagged variables representing the exposure effect over time because it is not reasonable to assume that such simultaneity will last over several time periods. Counting a family defection as one defection also helps in this regard.

Response to an external shock. The potential bias of response to an external shock (De Paula 2009), also referred to as environmental conditions (Manski 2000), results from external factors in the market that cause customers to defect at a given time; for example, if another firm makes a competing offer, customers who find the offer appealing will defect at roughly the same time. A possible way to deal with such issues is to model the time until the event (e.g., defection) and not just whether the event occurs (Barrot et al. 2008). Thus, we model the exact date of defection and not just its occurrence. We assume that a sequence of defections among customers is less likely to result from correlated unobservables, because such unobservables should make customers defect at the same time rather than in a time gap. Thus, a sequence of defections suggests the existence of an additional influence mechanism. We further examine time dynamics using several lagged variables to represent the exposure effect over time.

Competitive effects may also play a role. That is, higher defection rates may be anticipated if a competitor advertises more (Rojas and Peterson 2008), especially because a high level of advertising may indicate significant promotional offers. From another angle, the focal firm's advertising may encourage current customers not to defect. Because multiple members of a social network may be exposed to the same advertising campaigns, one might wonder whether the effects witnessed could be partially explained by the level of competitive advertising activity. To examine this point, we obtained (from a firm that specializes in following advertising spending in this market) monthly data on the advertising spending of the three main players in the market. Consistent with the norms of advertising analysis in this market, we created a measure for each customer's exposure to advertising by multiplying the monthly spending by the published monthly advertising ratings of that customer's age and gender group (to reflect the difference in television viewership among age and gender groups). We took into account 16 groups (8 age groups × 2 gender groups), over the 12 months of 2008. Next, we incorporated the respective levels of exposure to firm advertising and competitor advertising into our social effects model (for the full analysis, see Part B of the Web Appendix at http://www.marketingpower.com/jmnov11). We saw little or no effect of advertising on the hazard of defection in this market. The effect of the other variables, including the social variables, on defection did not change, and the effect of advertising itself on the hazard of defection was very small.

Results

The data for the hazard models include information for 1,103,059 personal customers. We used information for 693,042 customers to estimate the models (due to missing values). Of this population, 28,102 customers defected from the cellular provider during 2008. These customers constitute 4.1% of the initial population; this proportion is consistent with published ranges of cellular churn rates in the country we investigated.

Table 1 presents the estimation results (using the PHREG procedure in SAS) for the traditional and the social models (Models 1 and 2, respectively). The direction of results in the traditional model is as expected. The hazard of defection increases with the number of service records, when usage goes down, and the more a person talks outside the network. The social variables added in the social model increase the fit of the model as reflected in both the Akaike information criterion (AIC) and the Schwarz Bayesian criterion (SBC), which introduces a penalty term for the number of parameters in the model.

TABLE 1
Exposure to Defectors

Variable	Unit of Analysis	Model 1 Traditional Model Parameter Estimate	Model 1 Traditional Model Hazard Ratio	Model 2 Social Model Parameter Estimate	Model 2 Social Model Hazard Ratio
Exposure (first degree defections)	Number of defecting neighbors			586 (018)	1 797
Average tie strength with defecting neighbors	Percentage			021 (< 001)	1 022
Average homophily with defecting neighbors	Percentage			010 (< 001)	1 010
Average degree of defecting neighbors	Number			– 004 (< 001)	996
Customer degree	Number of neighbors			011 (001)	1 011
Service records	Number of records	033 (< 001)	1 033	033 (< 001)	1 034
Delta use	Percentage	– 0001 (< 001)	999	– 001 (< 001)	999
Economic incentive	Percentage	– 073 (< 001)	930	– 075 (< 001)	928
Average monthly usage	Hours	005 (< 001)	1 005	0003 (< 001)	1 000
Time from enrollment	Years	– 023 (001)	978	– 023 (002)	977
Student	1 = Student	023 (027)	1 023	005 (027)	1 005
Sociodemographic Group 1	1 = Group member	– 289 (028)	749	– 452 (028)	682
Sociodemographic Group 2	1 = Group member	– 327 (028)	721	– 383 (028)	730
Sociodemographic Group 3	1 = Group member	258 (021)	773	– 315 (028)	784
Age	Number of years	003 (009)	940	003 (< 001)	1 003
Gender	1 = Female	– 070 (012)	932	– 046 (012)	955
–2 LOG L		689,124		681,395	
AIC		689,146		681,427	
SBC		689,237		681,559	

Notes All parameter estimates are significant at $p <$ 01, except "Student" and "Age"

The Extent of the Social Effect

The social model in Table 1 shows that exposure to defecting neighbors has a considerable effect on a customer's hazard of defection, after controlling for a battery of variables that may affect retention The model shows that each defecting neighbor is associated with an increase of 79 7% in the focal customer's hazard of defection It is useful to compare the magnitude of these results with published probabilities of social effect on adoption We compared our results with findings from previous studies we were able to identify (almost all in the context of adoption) that examined the change in the probability (or hazard) of behavior due to exposure to the behavior of a social network neighbor (see Table W5 in Part C of the Web Appendix at http //www marketingpower com/jmnov11) The observed social effect on defection is as pronounced as that on adoption, which is consistent with findings regarding the choice of names for children (Berger and Le Mens 2009) and is even somewhat larger than reported effects from the adoption domain, with the exception of Hill, Provost, and Volinsky's (2006) findings, which are outliers in terms of magnitude The effects we observed are also somewhat larger than those reported in the case of quitting smoking

The Predictive Power of the Model

A key interest of managers in the defection behavior of their customers is the ability to better predict defection (Neslin et al 2006) A noteworthy question is whether the social variables help increase the predictive ability of churn models Because the Cox regression we conducted does not allow us to examine predictive power, we tested this question using a parametric hazard model, using Weibull as the parametric specification of the baseline hazard (Srinivasan, Lilien, and Rangaswamy 2004) Note that one limitation of the parametric analysis is that, unlike the Cox semiparametric regression, it does not allow time-variant variables (Bowman 2004), which makes it less robust given the temporal effects in our data set Therefore, using the parametric model for prediction purposes, we estimate the traditional and social models on a monthly basis

We calculated the median survival time of each customer in each model, and the defection prediction is based on this median For each model, we calculated the true positive rate—that is, the percentage of customers predicted to defect and actually defected—and the false positive rate—that is, the percentage of defection predictions that were found wrong

Examining the bottom 1% of customers in terms of median survival time, we find that the social model raises the prediction ability of true positive from 20 5% in the traditional model to 28 1%, a relative increase of 37 5% The social model also achieves a slight improvement over the traditional model in false positive rates (For further details on the prediction procedure, see Part D of the Web Appendix at http //www marketingpower com/jmnov11)

The Nature of the Social Process

Tie strength With respect to average tie strength, we observe that at any given time, a 1% increase in a customer's average tie strength with defecting neighbors is associated with an increase of 2 2% in that customer's hazard of defection For example, if a customer's average tie strength with defecting neighbors is 8% (which is approximately the average tie strength in our data), the customer's exposure to defecting neighbors is associated with an increase of 17 6% in the customer's defection hazard

Homophily We observe that every 1% increase in a customer's average homophily with defecting neighbors is associated with an increase of 1% in that customer's hazard of defection For example, if a customer is exposed to the defection of a neighbor who has one attribute in common with the focal customer (i e , the pair's homophily score is 25%), the exposure to this defecting neighbor is associated with a 25% increase in the customer's hazard of defection

FIGURE 1
Average Tie Strength with Defecting Neighbors Versus the Defection Percentage

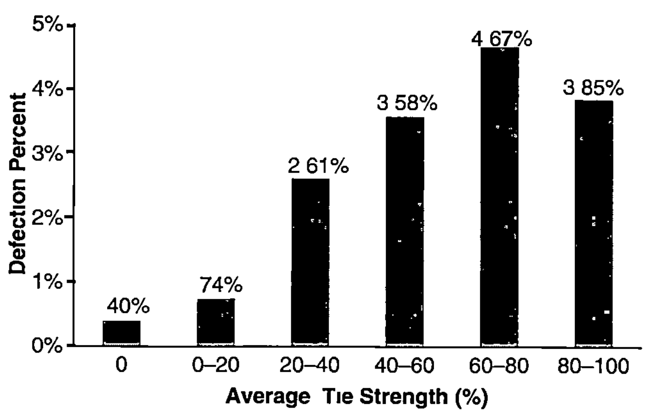
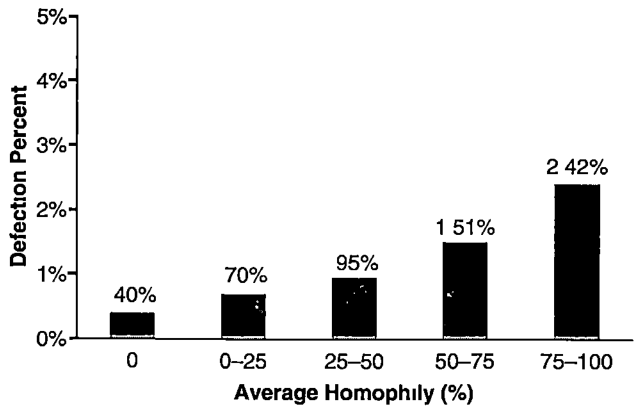


FIGURE 2
Average Homophily with Defecting Neighbors Versus the Defection Percentage



Figures 1 and 2 present these results from another angle the percentages of defectors with respect to their various levels of average tie strength (Figure 1) and homophily (Figure 2) with defecting neighbors (The level of similarity is measured in increments of 25% because it is a function of similarity across four demographic variables) It is clear that in general, a customer's likelihood of defection following exposure increases as a function of average tie strength and of average homophily with defecting neighbors

Economic incentive We find that the ratio between the volume of within-network communication and the volume of out-of-network communication, which we associated with an economic incentive due to network externalities, affected the defection decision The results indicate that a 1% decrease in the proportion of within-network communication is associated with a decrease of 7 2% in the hazard of defection (Model 2)

Focal customer's degree and average degree of defecting neighbors We observe that each additional neighbor in a focal customer's local network is associated with an increase of 1 1% in that customer's hazard of defection If we compare the average customer (whose degree is approximately 7) with the top 25% of customers (whose degree is greater than 10), we observe that being connected to three more neighbors is associated with an increase of 3 3% in the customer's hazard to defect Note that we obtain this result when we control for the number of defectors in the social network of the focal customer Moreover, we find that an increase of 1% in the average degree of defecting neighbors is associated with a decrease of 4% in the hazard of defection

The exponential decline of effects over time Table 2 presents the exposure model with lagging variables for five months (Model 3) We observe that the effect of a neighbor's defection on a focal customer's hazard of defection decreases exponentially over time (see also Figure 3), suggesting that as we move further away from the neighbor's defection event, the defection's effect on the focal customer's decision decreases

TABLE 2
Social Influence Decrease over Time

		Model 3	
Variable	Unit of Analysis	Parameter Estimate	Hazard Ratio
Exposure$_t$	Number of defecting neighbors at time t	860 (008)	2 364
Exposure$_{t-1}$	Number of defecting neighbors at time t−1	416 (018)	1 516
Exposure$_{t-2}$	Number of defecting neighbors at time t−2	203 (022)	1 225
Exposure$_{t-3}$	Number of defecting neighbors at time t−3	142 (023)	1 152
Exposure$_{t-4}$	Number of defecting neighbors at time t−4	140 (023)	1 150
Economic incentive	(%)	– 042 (< 001)	959
Average monthly usage	(hours)	– 005 (< 001)	995
Time from enrollment	(years)	– 025 (002)	975
Student	1 = Student	– 050 (026)	951
Sociodemographic Group 1	1 = Group member	– 392 (023)	676
Sociodemographic Group 2	1 = Group member	– 409 (027)	664
Sociodemographic Group 3	1 = Group member	– 199 (020)	820
Age	Number of years	001 (011)	1 001
Gender	1 = Female	– 039 (012)	962
-2 LOG L		743,755	
AIC		743,783	
SBC		743,899	

Notes All parameter estimates are significant at $p <$ 01, except "Student"

Customer Loyalty as a Moderator of the Social Effect

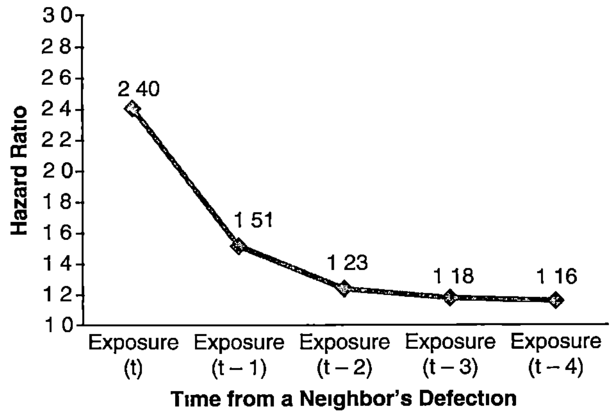
An additional analogy between the nonsocial and the social effects on retention involves the moderating effect of customer loyalty Researchers have argued that loyal customers tend to defect less and to be less affected by service failures or by price increases (Srinivasan, Anderson, and Ponnavolu 2002) In a sense, loyalty can be viewed as immunity against environmental effects that might encourage defection The question we ask is whether the same immunizing mechanism will be in effect among customers who are exposed to others' defections

In the context of social interactions, prior research has considered the impact of customer loyalty on the effect of word-of-mouth interactions, such studies have mostly considered the loyalty of the *provider* of information It has been suggested that a loyal, satisfied, and committed customer will tend to affect others more through word of mouth (De Matos and Rossi 2008) Here, we center on the *receiver* of information, who is exposed to the defection decisions of others We may expect that the same characteristics that cause loyal customers to have a greater effect on others (De Matos and Rossi 2008) might also cause them to be *less* affected than nonloyal customers by information that stems from defecting neighbors

Two widely used measures of loyalty in this regard are usage and customer tenure (Bolton 1998, Prins and Verhoef 2007) Heavy users of a given service, as well as tenured customers, may be less affected by information that stems from their neighbors compared with light users or new customers, respectively One reason for this is that loyal customers may rely on their own rich experience when deciding whether to remain with a firm or defect Another issue involves customer heterogeneity Nonloyal customers would be expected to defect from a service earlier, and therefore, tenured customers are inherently more loyal (Fader and Hardie 2010)

To investigate the role of customer loyalty in the social effects on retention, we observed the hazard function over time for the groups that are more extreme in terms of usage and tenure, respectively Figure 4 presents the estimated

FIGURE 3
Hazard Ratio as a Function of Time from the Neighbor's Defection



hazard ratios of the heaviest users (top 25% in terms of MOU and text messages) and the lightest users (bottom 25%) as functions of the amount of time following a neighbor's defection. Figure 5 presents the estimated hazard ratios for the highest tenured customers (top 25%, customers who stayed with the provider for seven years or more) compared with those of relatively new customers (bottom 25%, customers who stayed with the provider for two years or less).

Indeed, the hazard ratio curves of heavy users and tenured customers are clearly lower than those of light users and newer customers, respectively. We tested the difference between each pair of survival curves using the log-rank statistic of the Kaplan-Meier method (Allison 1995) and found it to be significant ($p < .001$). These results demonstrate the moderating role of customer loyalty in the social effects on retention. Loyal customers are less affected by negative information from their social network and are therefore even more likely to stay with the firm. The analysis done here enables us to quantify this underexplored phenomenon for the first time.

FIGURE 4
Hazard Ratio as a Function of Time from the Neighbor's Defection: Heavy Versus Light Users

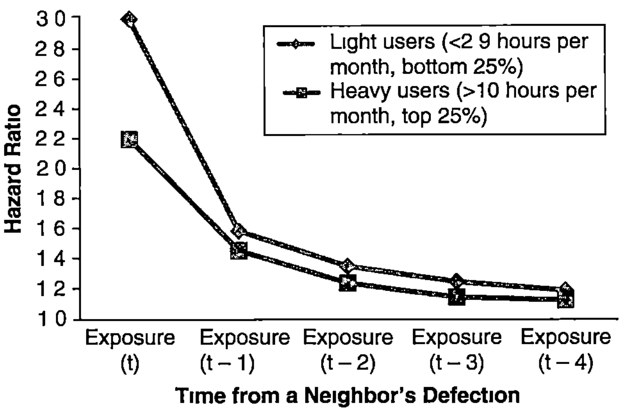
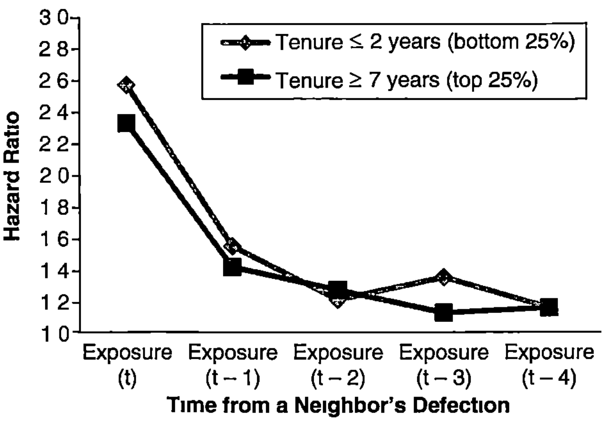


FIGURE 5
Hazard Ratio as a Function of Time from the Neighbor's Defection: Tenured Versus New Customers



Robustness Checks

Finally, in the course of building the model, we had to make some choices regarding the variable range and composition. To check the robustness of our findings, we estimated several variants of the social model (Model 2) and of the social model over time (Model 3) to determine whether the basic findings would remain similar.

First, we reestimated the social model (Model 2) using a different time interval for the main variables. Instead of using a monthly resolution (as used in Model 2), we chose a two-month resolution. Note that we cannot use a much larger window given the exponential decline over time in the social effect, demonstrated previously. Although, as expected, the hazard ratio for exposure decreased (from 1.79 to 1.47), in general, the value of other variables stayed the same. Regarding tie strength, we checked whether the absolute level of communication between two customers (i.e., the amount of time the focal customer spends talking with a given person) could be used as a measure of tie strength instead of the relative measure of communication that we originally adopted (i.e., the percentage of time the focal customer spends talking with a given person compared with the total amount of time he or she spends talking to customers in the network). We found that when we used the absolute value for communication volume, other variables stayed much the same, but tie strength itself became nonsignificant, which supports the relative approach we took. We also estimated a model that did not take into account exposure to defecting neighbors with whom the focal customer used to maintain weak ties, and we obtained similar results to the ones presented in Table 1 (Model 2). For homophily, another variable that may point to a similarity between customers, in addition to the ones we used, is customer tenure, because this may be related to the contractual obligations customers have. We found that adding similarity in tenure increased the effect of homophily itself on the hazard of defection, but it did not change the basic results in terms of the effects of other variables, including social variables such as exposure to defecting neighbors.

In addition, we conducted several other tests. We changed the exposure variable and, instead of looking at the number of defecting neighbors, used the cumulative number of defecting neighbors in a three-month-moving-window time frame. We also estimated the model for different segments, using segmentation based on age, usage, gender, tenure, and customer satisfaction. In all cases, in general, the results were consistent with those presented previously.

Discussion

Our results provide a consistent picture of how exposure to others' defections affects customers' defection decisions in the market we examined. We find that exposure to the attrition of network neighbors is associated with an increase in a customer's probability of defecting and that the effect is large. When controlling for various individual and social network factors, we observed that exposure to a defecting neighbor was associated with an increase of approximately 80% in a customer's probability of defection. These results are sizeable compared with reported probabilities that come mostly from the adoption domain. They clearly highlight the need for managers and researchers to study and understand the role of social effects in customer retention further.

A key question associated with the clustering of behavior in social networks is whether effects such as those we observed are indeed social effects. Recent research has suggested that many phenomena that are interpreted as social contagion effects may largely stem from homophily (Aral, Muchnik, and Sundararajan 2009). In the case of our study, it could be argued that people tend to be in social networks with people who resemble them, and because similar people with similar tastes may churn at the same time, the associated churn may be related to homophily and not to a social effect.

Indeed, the separation of homophily and communication effects is a significant challenge for network scholars. In this study, there are several indications that the hazard of defection is substantially influenced by social effects and not only by homophily. First, we controlled for homophily (through the demographic variables) and still observed a notable effect of exposure to defectors. Second, the exponential decay over time in the effect of a neighbor's defection suggests an effect that is more social in nature. It is not necessarily expected that such an effect would appear in the case of pure homophily. The significant effects of tie strength and of the economic incentive also point to the role of intercustomer communication in the defection decision.

The Nature of Social Effects on Retention

We find that the nature of defection-driven social effects is consistently similar to that reported in the domain of adoption. First, we find that a focal customer who has close ties with his or her defecting neighbors or is similar to them (in terms of personal characteristics) has a higher likelihood of defection.

We further witnessed an exponential decline over time in the exposure effect; the decline is rather rapid and is comparable to findings in the domain of adoption (Strang and Tuma 1993; Trusov, Bucklin, and Pauwels 2009). The similarity between the decline patterns in the cases of both adoption and attrition suggests that different types of social effects share similar dynamics (i.e., declining influence over time) and should encourage researchers to model and further explore the consequences of the social interaction carryover effect, as has been done for the advertising carryover effect (Tellis 2004).

We find that a customer with a higher degree (number of connections) has a greater likelihood of defecting. Note that we observe this effect after controlling for exposure to the number of defectors in the social network. Therefore, the effect cannot be attributed solely to the notion that higher-degree customers interact with more defectors. A possible explanation for this effect might be that, compared with customers with fewer connections, highly connected customers hear about more defections at higher degrees of separation.

Furthermore, an increase in the average degree of defecting neighbors is associated with a small decrease in the focal customer's hazard to defect. Recent research has highlighted the limited attention explanation (Katona, Zubcsek, and Sarvary 2011). This approach suggests that a person with a large number of social ties may be able to devote less attention to each tie, which eventually limits that person's level of influence on these ties. Thus, the level of attention a high-degree customer pays to his or her connections affects this customer's defection-related impact on each one.

These findings shed new light on the consequences of centrality in social networks. Often, high-degree customers are considered attractive customers because of their potential to affect others and also because their higher connectivity may lead to earlier exposure to innovations (Goldenberg et al. 2009). Our results suggest that greater connectivity may not mean greater influence and that there may even be a dark side of connectivity in the case of defections. Greater connectivity also means greater exposure to defectors and thus a greater chance of leaving. The trade-off between network hubs' greater influence and their greater risk of defection is a significant issue that should be pursued in further research.

Customer loyalty, which cannot be assessed in the case of new product adoption (because the customer has no prior relationship with the new product), has an effect on defection. We find that customers who are often labeled loyal (i.e., customers with higher tenure or who are heavier users) are less affected by others' defections. These results highlight an underexplored advantage of customer loyalty. For some time, loyalty was appreciated primarily for its contribution to customers' lifetime value (i.e., loyal customers were appreciated for providing higher profits for longer periods of time; Rust and Chung 2006). In addition, loyalty can contribute to customers' social value because retained customers influence others to adopt products through their social effects. Here, we observe a new aspect of the benefit of loyalty: It reduces a customer's tendency to be affected by others' defections.

Managerial Implications

A straightforward implication of our study is that firms should take customers' social networks into account when attempting to predict and manage customer churn. Recent research has demonstrated that the addition of network-related information to the commonly used geographic, demographic, and prior purchase data can substantially improve analysis of new product adoption (Hill, Provost, and Volinsky 2006) Our results suggest that this might also be the case for customer defections This possibility is especially significant in light of our observation that advertising had no effect on defection While advertising can certainly affect decision making in many markets, it seems that in mature markets such as the one we examined, customers' defection decisions are driven more by the customers' own experiences and by those of their social neighbors than by advertising A reasonable alternative to some of the retention-geared advertising may be to invest in developing a better understanding of the behavioral drivers of retention, taking a broader social network perspective For example, satisfaction surveys have traditionally focused on the individual, however, further examination of the satisfaction of friends, either by asking the focal customer or by independent surveys, might provide fruitful results

A significant finding in this regard is the strength of mere exposure to defectors Although specific properties associated with social relationships (e g , tie strength, homophily) had differential effects on the defection decision, we observed that even when we controlled for these aspects, mere exposure to defectors had a relatively strong effect on the defection decision An implication of this is that the absence of precise network-related information on defectors and their neighbors should not discourage firms from taking the social aspect into account Mere exposure to a defection may be key piece of information on which to act

Our results emphasize the urgency of managerial response to customer defections In the case we examined, much of a defector's effect on his or her neighbors occurs during the two months after defection If a firm aims to deal with the possible social influence of a defection, it should act swiftly, as soon as possible after the neighbor's defection event Another issue is the need to consider network information when examining customer lifetime value (Rust and Chung 2006) In the context of new product adoption, previous research has indicated the additional value of customers who affect the adoption of others (Hogan, Lemon, and Libai 2003), and a similar analysis should be done in the context of social effects on retention

The cellular industry offers researchers an almost unparalleled ability to study consumption behavior combined with social network information To the extent possible, we have tried to avoid the use of industry-specific variables, and we believe that the fundamental results presented here are relevant for understanding social effects on customer retention However, it is important to consider the extent to which the magnitude of the results presented here can be generalized for other industries One issue to consider is that mobile phone services are characterized by relatively high customer involvement and possible normative pressure (Herbjørn, Pedersen, and Thorbjørnsen 2005) Markets with these characteristics, coupled with possible price-driven network effects, are likely to be associated with relatively strong social effects on attrition Therefore, the effects found here may not be as strong in markets in which customer involvement is lower Another issue is that the industry we examine serves as both a representation of the social network of customers and the product domain of defections Because the cellular network enables the communications, we can expect that this service will be more frequently discussed in word-of-mouth communications than will other products Consequently, we may witness greater social effects for mobile phone–related communication than for other products From another angle, mobile phone services are often characterized by contractual agreements that curb the tendency of people to leave the service, even if they are influenced by others' word of mouth to do so Lower switching costs in other markets may be associated with greater social effects on the retention decision

The exact magnitude of the social effects on retention should thus be examined, when possible, for specific markets Given the limited access to social network data, managers' ability to do so depends on the extent to which new technologies will enable the collection of more data on the social behavior of customers One avenue might be to collect data through sources such as Facebook and other social networking sites Another possibility is to take advantage of the emerging use of brand and online communities to better assess the relationship between social behavior and defection Third-party providers that collect data from sources such as LinkedIn can also help in this regard

Further Research and Limitations

Finally, some limitations of this study should be highlighted The use of data from multiple industries and of products that are exogenous to the network (i e , a product that is not the communication vehicle itself) can strengthen our knowledge of the magnitude of effects and the dynamics of social effects on retention Additional information on customers' motivations to defect would have enabled us to distinguish the effects of the various defection types (e g , active vs passive defections) Furthermore, our data capture detailed information regarding customers' communication within a provider's network, as well as some information with respect to their overall communication habits It would be beneficial, though challenging due to competition aspects, to capture a person's entire social network Although there are research efforts in this direction (Eagle, Pentland, and Lazer 2009), the challenge of combining such data with real consumption decisions must still be overcome

The cellular service market we examined in this study is a mature market, characterized by a high penetration rate Because customers do not leave the category altogether but rather switch to a competing provider, it would be useful to consider the extent to which customers follow not only their neighbors' defection decisions but also their neighbors by choosing the same new provider This requires data that are not available to us at this point

Additional measures, such as the network distance between the focal customer and other potential influencers, could contribute to this study In the context of public health (e g , obesity), researchers have suggested that such influence takes place (Christakis and Fowler 2007), however, in the context of consumption decisions, second-degree influences have not been tested This may be carried out by assessing the extent to which defections that happen two (and possibly three) degrees of separation from an individual affect his or her probability to defect This analysis is significant but outside the scope of the current study

Assessing the extent and nature of social processes involved in customers' decisions to defect is crucial to better understand, model, and eventually manage customer churn Given that retention is central to firms' bottom line, we believe that further exploration of the social effects on customer retention will contribute to this promising line of research

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Vardit Landsman & Stefan Stremersch

Multihoming in Two-Sided Markets: An Empirical Inquiry in the Video Game Console Industry

Two-sided markets are composed of platform owners and two distinct user networks that either buy or sell applications for the platform The authors focus on multihoming—the choice of an agent in a user network to use more than one platform In the context of the video game console industry, they examine the conditions affecting seller-level multihoming decisions on a given platform Furthermore, they investigate how platform-level multihoming of applications affects the sales of the platform The authors show that increased platform-level multihoming of applications hurts platform sales, a finding consistent with literature on brand differentiation, but they also show that this effect vanishes as platforms mature or gain market share The authors find that platform-level multihoming of applications affects platform sales more strongly than the number of applications Furthermore, among mature platforms, an increasing market share leads to more seller-level multihoming, while among nascent platforms, seller-level multihoming decreases as platform market share increases These findings prompt scholars to look beyond network size in analyzing two-sided markets and provide guidance to both (application) sellers and platform owners

Keywords two-sided markets, multihoming, entertainment markets, indirect network effects, video game industry

A two-sided market is composed of two distinct user networks that provide each other with network benefits through a platform by either buying or selling applications for the platform (Rochet and Tirole 2006) We refer to these distinct user networks—the two sides of the market—as buyers and sellers, respectively Two-sided markets are pervasive in today's economy For example, consumers will prefer a credit card that many merchants accept, while merchants will prefer a credit card that many consumers carry Similarly, buyers will prefer auction sites with a large number of sellers, while sellers will prefer auction sites on which many buyers bid Other examples of two-sided markets are entertainment platforms (consumers and content publishers), shopping malls (consumers and retail outlets), and computer networks (computer users and software providers)

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Both economists and marketing scholars have investigated two-sided markets (for a review, see Stremersch et al 2007), studying new product growth or competition between platforms Prior literature examining two-sided markets has focused almost exclusively on quantity (i e , the size of the two user networks) as the network benefit that the two sides of the market contribute to each other (e g , Basu, Mazumdar, and Raj 2003, Church and Gandal 1992, 1993, Dranove and Gandal 2003, Frels, Shervani, and Srivastava 2003, Gandal, Kende, and Rob 2000, Katz and Shapiro 1985, LeNagard-Assayag and Manceau 2001, Nair, Chintagunta, and Dubé 2004, Stremersch et al 2007) However, user networks may contribute to each other in dimensions other than their mere size—for example, in quality (Binken and Stremersch 2009) or in the extent of multihoming (the current study)

Multihoming refers to the choice of an agent in a user network to use more than one platform Single-homing refers to the choice of an agent in a user network to use only one platform Single-homing and multihoming are logical opposites, and we conceptualize and operationalize both concepts as such in the rest of the article This article focuses in particular on multihoming decisions of sellers rather than of buyers [1]

We differentiate seller-level multihoming on a given platform (i e , the extent to which the applications of a particular seller on the platform are also available for buyers

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[1] Multihoming among buyers (e g , consumers owning multiple video game console platforms) is beyond the scope of the current study

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of competing platforms) from platform-level multihoming (i e , the extent to which applications on a particular platform are also available for buyers of a competing platform) Thus, platform-level multihoming represents the aggregation of seller-level multihoming over all sellers providing applications for a particular platform A seller can multihome many (few) of its applications for a given platform, which in our terminology reflects a high (low) degree of seller-level multihoming At the platform level, many (few) of the applications available for a platform across all sellers may be multihomed, which in our terminology reflects a high (low) degree of platform-level multihoming

Theoretical models have suggested that the extent to which applications on a particular platform are multihomed (platform-level multihoming) constitutes an important driver of the outcome of platform competition (Armstrong 2006, Armstrong and Wright 2007, Caillaud and Jullien 2003, Hermalin and Katz 2006, Rochet and Tirole 2006) The special relevance of multihoming to platform owners (Shapiro 1999) stems from the fact that the differentiation of a platform partially lies with the differentiation of the characteristics of its user network(s) from the characteristics of the user network(s) of competing platforms, beyond the differentiation between the other characteristics (e g , hardware) of the platforms

Seller-level multihoming decisions are important decisions for sellers in two-sided markets On the one hand, a seller that single-homes on a given platform forgoes potential revenues from the buyers of competing platforms On the other hand, single-homing sellers may have lower costs (e g , they avoid the cost of adapting their applications to multiple platforms) or be paid exclusivity fees by owners of platforms on which they single-home

Multihoming decisions are of great importance to firms in many contexts For example, researchers credit the single-homing decision by several movie studios (e g , Warner Brothers) as an important factor in the platform battle between Toshiba's HD DVD and Sony's Blu-ray (Barnes 2007, Edwards and Grover 2008) Sony is also reported to have paid a substantial amount to movie studios to prevent attractive movies on Blu-ray from being multihomed to HD DVD

The video game console market—the context of the current study—is another market in which sellers' multihoming decisions may significantly affect their profits For example, Take-Two's Rockstar Games unit was reported to have received an estimated $50 million from Microsoft to create two episodes of *Grand Theft Auto IV The Lost and Damned* and single-home them for Microsoft Xbox 360 However, by single-homing, Take-Two's Rockstar Games unit missed the revenues that these games might have generated, especially from Sony PlayStation3 users

Despite the high relevance of multihoming in many industries and a stream of recent analytical research (mostly in economics), little empirical research on multihoming exists (for exceptions, which we in turn extend, see Binken and Stremersch 2009, Corts and Lederman 2009, Rysman 2004) More precisely, we study two research questions, which have remained largely unaddressed by prior (empirical) literature First, we investigate what conditions affect seller-level multihoming decisions on a given platform (in our case, multihoming decisions of game publishers) Second, we study whether and under what conditions platform-level multihoming affects the sales of the platform (in our case, sales of video game consoles), explicitly controlling for the number of applications sold for the platform

We focus on the age and market share of the platform as conditions that may influence the extent of seller-level multihoming on the platform and the effect of platform-level multihoming on platform sales Both age and market share of a platform significantly affect the uncertainty that consumers face in their platform adoption decision Uncertainty plays a dominant role in any new technology adoption, but does so especially in two-sided markets because the future adoption by the seller network affects the future utility of a platform for consumers The uncertainty regarding a platform decreases with age and market share, which in turn affects the extent to which the platform needs a clearly differentiated positioning to be successful Thus, in short, nascent and low-market-share platforms may have a greater need for a differentiated network of sellers than mature and high-market-share platforms

Our empirical findings are as follows We find that the (negative) effect of platform-level multihoming on platform sales is larger than the (positive) effect of the number of applications on platform sales We also find that this negative effect of multihoming is prominent for nascent platforms and for platforms with a small market share but it fades as platforms mature and gain market share These findings have implications for sellers and platform owners They may provide sellers with a better understanding of the conditions under which the platform owner may be willing to pay more or less for single-homed applications Platform owners can also gain understanding of the conditions in which it benefits them to encourage or discourage single-homed applications for their platforms These findings may also affect the future behavior of industry observers (e g , in the reports they publish) and academic scholars (e g , in the models they develop) because they force both observers and academics to move away from the logic of network size to the logic of multihoming

We also find that a platform's age and market share, among other factors, drive the extent of seller-level multihoming on that platform On the one hand, the larger the market share of a mature platform among buyers, the more of its applications will be multihomed On the other hand, the larger the market share of a nascent platform, the fewer of its applications will be multihomed

We organize the remainder of this article as follows In the next section, we review the literature on multihoming Then, we develop hypotheses for the effects of multihoming on platform sales and for the determinants of multihoming The fourth section presents the data we use to test the developed theory We develop our model in the fifth section and present the estimation procedure in the sixth section We present the estimation results in the seventh section We conclude with a discussion of the implications and limitations of our research

Prior Literature on Multihoming

We can distinguish two types of prior analytical models on multihoming in two-sided markets The first type examines what the equilibrium outcome is if a multihoming option exists for a user group, without the (potential) existence of exclusive contracts (Armstrong 2006, Caillaud and Jullien 2003, Choi 2007, Doganoglu and Wright 2006, Rochet and Tirole 2003, 2006). Most relevant to our own inquiry is the theoretical model Choi (2007) proposes, which considers the level of suitability of a seller's applications for a specific platform as a determinant of that seller's decision to single-home its applications on that platform. In our theoretical framework, we also adopt this notion of seller–platform fit as one of the factors influencing multihoming decisions. We theorize that the fit between a seller and a given platform is conveyed through the sales success of the sellers' applications among the buyers of the platform.[2]

A second set of models examines the equilibrium outcome if a platform owner offers an option of an exclusive contract—a contract under which agents in a user network commit to single-home on a given platform—in a context in which the multihoming option exists, or in specific settings of platforms' competitive strength and life-cycle stages (Armstrong and Wright 2007, Balto 1999, Carrillo and Tan 2006, Doganoglu and Wright 2010, Mantena, Sankaranarayanan, and Viswanathan 2007, Shapiro 1999). Such exclusive contracts are relevant to market outcomes only when sellers would otherwise opt to multihome or to single-home on a competing platform. Scholars in this area debate the conditions under which the employment of such exclusive contracts has negative welfare consequences. Armstrong and Wright (2007) find that exclusive deals may actually promote a superior market outcome for both buyers and sellers under certain market conditions. Doganoglu and Wright (2010) find that exclusive deals are inefficient when offered by incumbent firms as a tool to dominate a market in the face of entry, and the seller network is the primary beneficiary of such deals.

Note that in our theoretical framework, as presented in the next section, we do not specifically distinguish different motivations for inducing single-homing through exclusive contracts, nor do we determine the beneficiaries of such actions. However, we consider the age and the market share of the platform as determinants of multihoming decisions and, in doing so, aim to generalize the conditions under which we can expect higher levels of multihoming. In this respect, a study of special relevance to our present inquiry is that of Mantena, Sankaranarayanan, and Viswanathan (2007). Their analytical model examines the conditions under which single-homing can be observed and the impact of single-homing on industry outcomes, taking into account the typical high level of uncertainty buyers in two-sided markets face. Mantena, Sankaranarayanan, and Viswanathan's work applies to the context of high technology and media markets, which share many features with our empirical context.

Empirical studies relevant to our context are few in number and different in nature from our current inquiry. Rysman (2004) documents network benefits between buyers (consumers) and sellers (advertisers) of a platform (yellow pages). For simplicity reasons, he assumes that buyers single-home and sellers choose platforms only on the basis of the number of buyers of the platform. Corts and Lederman (2009) study the influence of platforms' installed base of buyers on the number of single-homed and multihomed applications published. They also study the influence of the number of applications on own and competing platform sales, which allows them to be the first to provide evidence of network benefits gained not only for a given platform but also across competing platforms. Binken and Stremersch (2009) are the first to show that superstar applications—applications of very high quality (i.e., a quality rating $\geq 90/100$) that command a disproportionately large payoff in application sales—affect platform sales beyond the effect of the total number of applications. They find that the effects of single-homed and multihomed superstar applications on platform sales are similar.

Using new metrics for seller-level and platform-level multihoming, we extend this empirical literature by (1) quantifying the effect of platform-level multihoming on platform sales across the entire collection of applications and over all competing platforms in a direct manner, (2) theorizing and empirically documenting the moderating role of market share and age of the platform on the relationship between platform-level multihoming and platform sales, and (3) theorizing and empirically documenting contrary effects of platform market share on seller-level multihoming, depending on the age of the platform.

Theory Development

In this section, we first derive our theoretical expectations on the effect of platform-level multihoming on sales of the platform and the conditions that may influence this effect. In terms of conditions, we focus on the age and market share of the platform, because an increase in either may significantly lower the uncertainty that consumers face in their platform adoption decision. We expect that the greater this uncertainty, the more a platform needs a clearly differentiated positioning to be commercially successful. Then, we explore the effect of such conditions on seller-level multihoming on a given platform. Figure 1 provides a graphic overview of our conceptual framework and the hypotheses we posit. For the derivation of our hypotheses, we build on theories on differentiation and uncertainty in two-sided markets.

The Influence of Platform-Level Multihoming on Platform Sales

When a platform's applications are multihomed on other platforms, the platform may not be able to differentiate itself through the applications of its network of sellers. Differentiation provides brands with greater resistance to competitive attacks (e.g., Aaker 1991, Carpenter, Glazer, and Nakamoto 1994). Thus, in two-sided markets, in which buyers and sellers endow each other with network benefits, a platform for which few applications are multihomed can achieve greater differentiation than a platform for which many applications are multihomed (Mantena, Sankaranarayanan, and Viswanathan 2007). For example, the video game *Tetris*, which was single-homed on Game Boy, is credited for much of the Game Boy's success (Allen 2003, Rowe 1999).

Platforms might not all be equally affected by a lack of differentiation from multihoming. We expect that nascent

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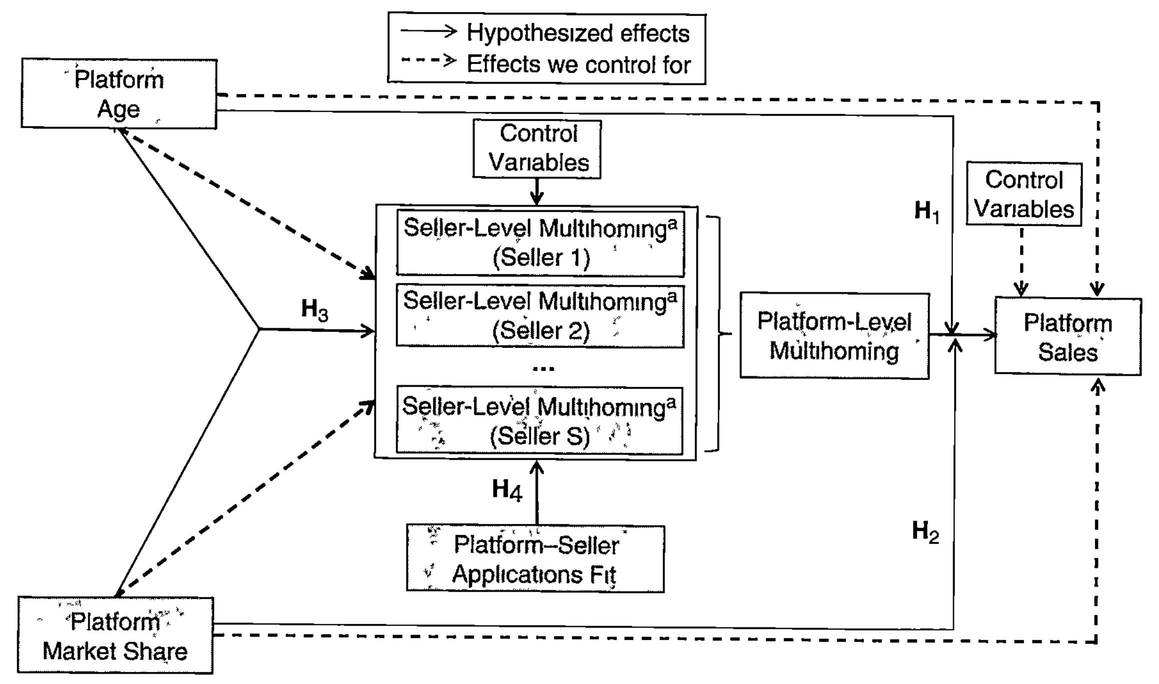
[2] In the section on robustness, we also consider an alternative measure of seller-platform fit that is based on application quality rather than application sales.

FIGURE 1
Conceptual Framework



Hypothesized effects
Effects we control for
Platform Age
Control Variables
Seller-Level Multihoming^a (Seller 1)
Seller-Level Multihoming^a (Seller 2)
...
Seller-Level Multihoming^a (Seller S)
H3
H4
Platform–Seller Applications Fit
Platform-Level Multihoming
H1
H2
Control Variables
Platform Sales
Platform Market Share

[a]Multihoming across all the seller's applications for the platform

platforms (i e , platforms that have been introduced only recently) are more vulnerable to multihoming of their applications than mature platforms The level of buyers' uncertainty on a nascent platform is high initially, after which uncertainty fades as the platform matures Under the high uncertainty characterizing nascent platforms, buyers' preferences for a platform can more easily tip in favor of a platform for which few of its applications are multihomed than a platform for which many of its applications are multihomed, keeping the number of applications constant (Mantena, Sankaranarayanan, and Viswanathan 2007) As platforms mature, buyers' expectations about the ultimate success of the platform become more certain (Schilling 2002), and the need for differentiation through a platform's applications decreases We hypothesize the following

H_1 There is a negative relationship between platform-level multihoming of applications and platform sales for nascent platforms, which fades as platforms mature

Two-sided markets are known to "tip" in favor of the largest-share platform (Arthur 1989) As a platform increasingly beats other platforms in terms of market share, other platform attributes (e g , the extent of platform-level multihoming) become less important in buyers' platform choice A large market share of a platform provides a clearer signal of the superior value the platform offers for buyers than attributes that are more difficult for a consumer to measure (Schilling 1999), such as the number of applications for the platform that are multihomed

The important role of platform market share as a signal for superior value also fits prior findings in differentiation theory Carpenter and Nakamoto (1989) argue that greater similarity between brands hurts only the nondominant brand and not the dominant brand In the context of pioneering advantages, they attribute an overall perceptual distinctiveness to dominant brands that allows them to overshadow similar, but smaller, competitors Feinberg, Kahn, and McAlister (1992), who study variety seeking, also find that when consumer preferences remain constant, sharing more features with competing brands hurts small brands but does not hurt dominant brands As we argued previously, platform-level multihoming may lead to a lack of differentiation, which, according to this logic, would hurt dominant brands less than nondominant brands Therefore, we hypothesize the following

H_2 There is a negative relationship between platform-level multihoming of applications and platform sales for platforms with a small market share, which fades as platforms gain market share

In our empirical tests of the preceding hypotheses, we control for several other variables that may affect platform sales in addition to platform age and market share[3] First, we control for the number of applications that are available for the platform, which we expect to positively affect platform sales (Church and Gandal 1993, Katz and Shapiro 1994) Second, we control for the number of platforms that compete with one another Competition may increase platform sales because it may benefit the growth of the industry (Agarwal and Bayus 2002), or it may decrease platform sales through platform switching (Carpenter and Lehmann 1985) Third, we control for the price of the platform, which we expect to negatively affect platform sales Fourth, we include the number of superstar releases for the platform (Binken and Stremersch 2009) In addition, we control for seasonality in sales by including a December dummy, for inertia in sales by including the platform's sales in the previous period, and for other time-invariant platform features by including platform dummies In our case, such platform features can be technical attributes such as data width, clock speed, memory, the type of controller, the media device (e g , CD-ROM, DVD, Blu-ray), or the possibility to access the Internet, as well as other aspects such as the brand name and credibility of the platform owner

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[3] Note that in the application context of this study, the correlation between market share and platform sales is low (33) because of the high category sales growth over time

Determinants of Seller-Level Multihoming

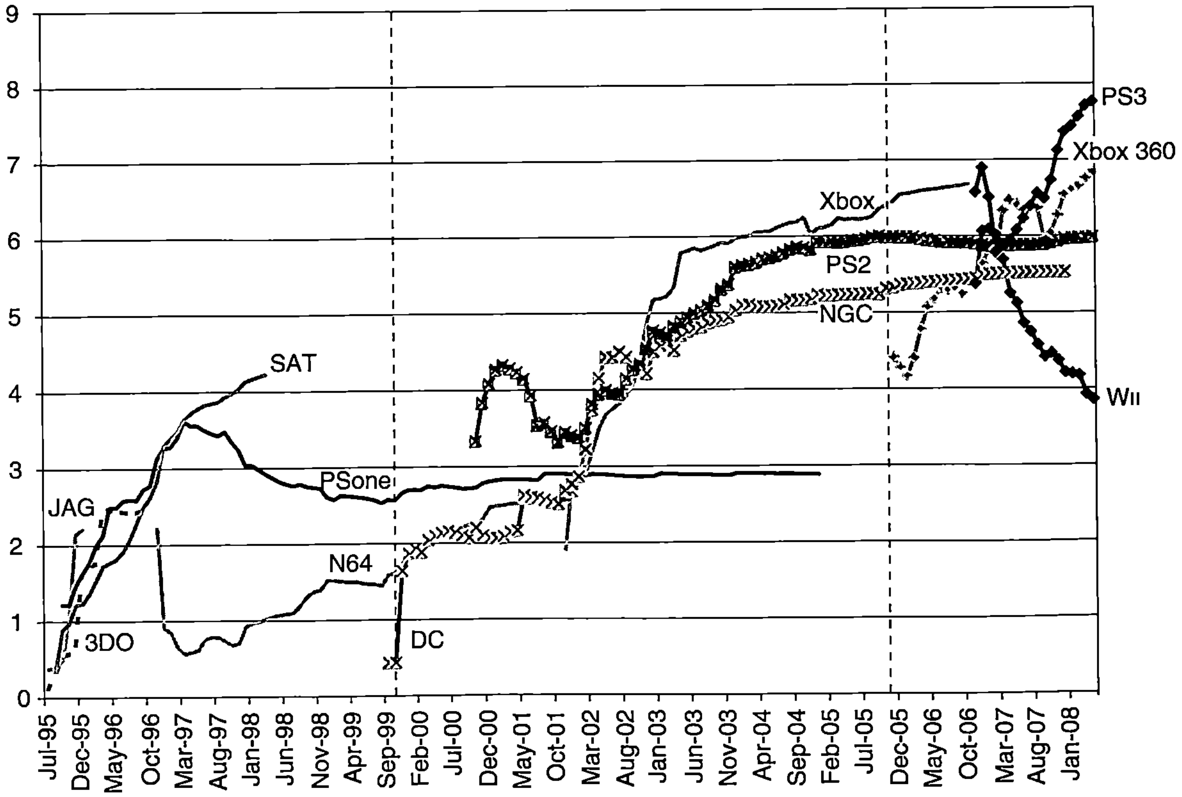
Seller-level multihoming is the outcome of the decision of platform owners to provide incentives to lower the level of seller-level multihoming and the decision of sellers on the level of seller-level multihoming, given such incentives We theorize on the effects of age and market share of the platform and the seller–platform fit on the platform owner and seller decisions, and, in turn, on the level of seller-level multihoming

As H_1 predicts, when a platform is mature, the platform owner has little need to offer sellers incentives to discourage them from multihoming Owners of nascent platforms may have a greater need to offer sellers such incentives These arguments may explain the increase in multihoming over the life cycle of a platform (as illustrated in Figure 2)

Beyond this direct effect, platform age may also interact with the market share of the platform The owner of a mature platform with a large market share will have an even lower need to offer incentives to discourage sellers from multihoming than the owner of a mature platform with a small market share, because high-share platforms are hurt less by seller-level multihoming than low-share platforms Therefore, as the market share of a mature platform increases, we expect the platform owner to offer sellers fewer incentives that discourage them from multihoming At the same time, if a small-share, mature platform offers such incentives, sellers may still accept them, despite the low market share of the platform because such platforms may still represent sizeable buyer networks in absolute numbers (Mantena, Sankaranarayanan, and Viswanathan 2007) In summary, the incidence of seller-level multihoming among mature platforms likely increases with market share

For nascent platforms, the opposite is true In the early stage of the life cycle of a new platform in a two-sided market, buyers are still largely undecided, and the user base is still small (see Mantena, Sankaranarayanan, and Viswanathan 2007, Schilling 2002, Stremersch et al 2007) Nascent platforms are therefore likely to offer sellers incentives to discourage them from multihoming because the lack of differentiation caused by multihoming may substantially hurt such platforms Sellers will more easily accept such incentives from owners of platforms with a greater market share because their higher market share serves as a signal of superior value to sellers Therefore, we expect to find a lower incidence of seller-level multihoming for

FIGURE 2
Multihoming for All Platforms (July 1995–April 2008)



nascent platforms with greater market shares (compared with nascent platforms with lower market shares) We hypothesize the following

> H_3 The relationship between the market share of a platform among buyers and the extent of seller-level multihoming of applications for that platform is (a) negative for nascent platforms and (b) positive for mature platforms

Next, we theorize that a better fit between a seller's applications and the characteristics of the platform or of the platform's buyers' network (Choi 2007) increases the platform owner's inclination to make high payments to the seller to reduce the degree to which its applications are multihomed At the same time, the seller is more likely to accept such payments from the owner of a platform with which it shows a better fit than from the owner of a platform with which it shows a worse fit We use the prior sales success of the seller's applications among the buyers of the platform as an indicator of seller–platform fit We hypothesize the following

> H_4 Seller-level multihoming increases as seller–platform fit decreases

Note that a potential counterargument may lie in a cooperation dilemma known in the economics literature as the "holdup problem" This problem emerges in situations in which cooperation between two market players (in our case, the platform owner and the seller) is the most efficient strategy, and yet the players refrain from cooperation because they do not want to give the other party increased bargaining power (Edlin and Reichelstein 1996, Schwarz and Takhteyev 2010) However, in our context, this holdup problem is unlikely to occur, because the exclusivity agreements between sellers and platform owners are made for each application separately, often before the application is developed In our empirical tests of the H_3 and H_4, we again control for the number of applications that already exist for the platform, inertia in multihoming decisions, and the characteristics of the platforms that are time-invariant (see previous discussion) using platform dummies

Data

We test our hypotheses using data from the video game console industry This section first describes this research context and our data collection procedures, after which it turns to the operationalization and description of the measures we employ

Research Context: The Video Game Console Industry

The video game console industry dates back to the early 1970s In 1972, the television maker Magnavox introduced Odyssey, the first home video game console The system came with 12 games, including versions of tennis and Ping-Pong, and more than 100,000 game consoles were sold by the end of 1972 Since then, seven sequential generations of game consoles have been introduced, one every five to six years Each generation is typically characterized by a superior technology, often with new and superior console accessories, and consists of a small number of competing, incompatible video game consoles and a collection of game titles In the first generations of home video game consoles, the games were typically developed and published by the console owners Over time, platforms (i e , consoles) and applications (i e , games) in the video game industry became increasingly separated, with large publishers specializing in games, without a footprint in console manufacturing (e g , Electronic Arts)

The popularity of video game consoles has grown rapidly in the past two decades, with more than 55 million seventh-generation game consoles sold in the United States as of March 2010 (*Digital Digest* 2010) Recently, playing video games was rated the top fun entertainment activity by American households, outpacing watching television, surfing the Internet, reading books, and going to or renting movies (Interactive Digital Software Association 2001) ACNielsen's 2005 study "Benchmarking the Active Gamer" shows that the demographic of gamers widened between 2000 and 2005, with more women playing and an emerging market of males in the 25- to 34-year age range This study also found that gamers spent more time (25% of their leisure time) playing games (*BusinessWeek* 2005)

The video game console market is well suited for testing the implications of multihoming in two-sided markets First, this market is often cited as the canonical example of a two-sided market (Clements and Ohashi 2005, Shankar and Bayus 2003) Second, there is sufficient variation in this market, both over time and across consoles, in multihoming, the number of applications, and platform sales Third, the business of publishing video games today is similar to the publishing of DVDs and other entertainment products

Our data cover the sales of 12 home video game consoles from three consecutive generations (i e , generations 5, 6, and 7), including unit sales and quality ratings for all games sold for the analyzed systems (4230 titles) in the United States over 154 consecutive months starting from July 1995 The consoles include Sega Saturn, Sony PlayStation, Nintendo 64, 3DO Multiplayer, Atari Jaguar, Sega Dreamcast, Sony PlayStation2, Nintendo GameCube, Microsoft Xbox, Microsoft Xbox 360, Sony PlayStation3, and Nintendo Wii

The fifth video game console generation is known as the 32-/64-bit generation This generation lasted approximately from 1993 to 2002 The three dominating consoles of the fifth generation are Sega Saturn (introduced in May 1995), Sony PlayStation (introduced in September 1995), and Nintendo 64 (introduced in September 1996) Other consoles that were part of this generation and are covered in our data are the 3DO Multiplayer and Atari Jaguar, but they had a much lower sales level and no significant impact on the structure of the market

The sixth video game console generation, also known as the 128-bit generation, refers to video game consoles that were introduced between 1999 and 2001 Platforms of the sixth generation include Sega's Dreamcast (introduced in September 1999), Sony's PlayStation2 (introduced in October 2000), and the Nintendo GameCube and Microsoft's Xbox (both introduced in November 2001) The consoles of the sixth generation showed great similarity in terms of their technological characteristics

The seventh video game console generation (the current generation) includes game consoles that have been released since 2005 This generation began on November 2005 with the release of Microsoft's Xbox 360 One year later, Sony's PlayStation3 and Nintendo's Wii were also introduced to the market PlayStation3 was introduced with great delay and manufacturing cost concerns, given the inclusion of the Blu-ray reader format Sony had pioneered Nintendo's Wii brought unique motion controllers to the market, which set it apart from Sony and Microsoft and enabled unique applications (e g , motion-controlled sports)

Although our data on the fifth-generation consoles cover all months starting from their introduction, we chose July 1995 as the starting point of our analysis to avoid a potential bias in our multihoming measure caused by the sharing of titles with consoles of the fourth generation, on which we do not have data We also exclude months that show very low platform sales figures (<5000 units) at the end of a platform's life cycle, because they represent nonactive periods in which the system is already abandoned

We sourced data on console and game release time, sales, and prices from the NPD Group, a well-known market research firm that covers the game industry NPD's data have been used previously in academic marketing research (Binken and Stremersch 2009, Stremersch et al 2007) To evaluate the number of superstars released for each platform, we used NPD quality ratings and inferred whether a game was a superstar according to a metric developed by Binken and Stremersch (2009)

Measures

Our central construct is the platform-level multihoming, $\text{Platform\_Multi\_Homing}_{pt}$, which is the extent of platform-level multihoming for the applications of platform p at time t We operationalize $\text{Platform\_Multi\_Homing}_{pt}$ as follows We begin by developing an indicator variable, denoted as Home_{at}, which indicates for each application a, available for sale at time t, whether it is multihomed across platforms at time t[4]

$$(1)\quad \text{Home}_{at} = \begin{cases} 0 & \text{if application a is single-homed at t} \\ 1 & \text{otherwise} \end{cases}$$

Next, we calculate the extent of platform-level multihoming for each platform p at time t by weighing Home_{at} according to the relative share of application a in the overall application sales for platform p by time t (Share^{A}_{apt}), as follows

$$(2)\quad \text{Platform\_Multi\_Homing}_{pt} = \sum_{a=1}^{A} (\text{Home}_{at} \times \text{Share}^{A}_{apt}),$$

where A is the overall number of applications in the market In cases in which a platform offers only applications that are single-homed, $\text{Platform\_Multi\_Homing}_{pt}$ equals 0 As a platform's applications are increasingly multihomed, $\text{Platform\_Multi\_Homing}_{pt}$ approaches 1

The seller-level multihoming on a given platform, $\text{Seller\_Multi\_Homing}_{pst}$, is the extent to which the applications of seller s for platform p are multihomed at time t We calculate the extent of seller-level multihoming for each platform p at time t by weighing Home_{at} over all applications of seller s, A^S, according to the relative share of application a in the overall application sales for platform p by time t (Share^{A}_{apt}), as follows

$$(3)\quad \text{Seller\_Multi\_Homing}_{pst} = \sum_{a=1}^{A^S} (\text{Home}_{at} \times \text{Share}^{A}_{apt})$$

As Equations 2 and 3 show, the platform-level multihoming is an aggregation of seller-level multihoming across all sellers offering applications for the platform

As theorized previously, we use the following variables to explain seller-level multihoming on a given platform, in addition to platform dummies and lagged seller-level multihoming Platform_Age_{pt} is the number of months that elapsed between the introduction of platform p and time t, $\text{Platform\_Mar\_Share}_{pt}$, the market share of platform p at time t, is equal to the sales of the platform p at time t divided by the sum of sales for all platforms available at time t, $\text{nr\_Applications}_{pt}$ is the cumulative number of applications released for platform p by time t, and $\text{Seller\_Platform\_Fit}_{pst}$ is the average penetration rate, among the buyers of platform p, across all applications released by seller s for platform p by t

$\text{Platform\_Sales}_{pt}$ is the number of units of platform p that are sold during month t In addition to the aforementioned measures (e g , $\text{Platform\_Multi\_Homing}_{pt}$, $\text{Platform\_Mar\_Share}_{pt}$, Platform_Age_{pt}, $\text{nr\_Applications}_{pt}$), we include the following measures for the other variables in the platform sales equation $\text{Platform\_Comp\_Nr}_{pt}$ is the number of other active platforms in the market at time t, $\text{Platform\_Price}_{pt}$ is the retail price of platform p at time t, which we instrument for, as explained subsequently, $\text{Superstar\_Release}_{pt}$ is the number of applications for platform p released at time t with a quality rating of 90 and greater (following Binken and Stremersch 2009), and I^{Dec}_{t} is a December dummy that takes the value of 1 if t is the month of December and 0 if it is not To control for inertia and contagion, we also include lagged platform sales Finally, we include platform dummies to account for intrinsic, non-time-varying, differences between consoles

To address the endogeneity of $\text{nr\_Applications}_{pt}$, we also specify an auxiliary regression for the number of applications of a given seller for the platform, $\text{nr\_Applications}_{pst}$ Beyond platform dummies, $\text{Platform\_Mar\_Share}_{pt-1}$, Platform_Age_{pt}, I^{Dec}_{t}, and $\text{nr\_Applications}_{pst-1}$, we also include the competition among sellers for platform p, denoted as $\text{Seller\_Comp\_Nr}_{pt}$, which we calculate as the number of sellers that have released applications for platform p by t

Descriptives

Table 1 shows the descriptive statistics of the variables that enter our three equations (The details on the specification of the three equations appear in the "Model" section) Figure 2 shows the extent of platform-level multihoming for each platform in our data over time It shows that platforms in Generation 6—Xbox, PlayStation2, and Nintendo GameCube—are similar in terms of platform-level multihoming of applications, while among platforms in Generations 5 and 7, there are larger differences in platform-level multihoming of applications across platforms Figure 2 also reveals an increasing extent of platform-level multihoming in the video game industry over the analyzed time frame

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[4] In the robustness analysis, we also implement other measures for $\text{Platform\_Multi\_Homing}_{pt}$ and $\text{Seller\_Multi\_Homing}_{pst}$ grounded in alternative Home_{at} measures

TABLE 1
Descriptive Statistics

A: Platform Sales Equation

	Platform Sales	Platform Multihoming	Platform Age	Platform Market Share	Number of Applications^a	Number of Platform Competitors	Platform Price	Superstar Release	December Dummy
Platform multihoming	14								
Platform age	– 06	19							
Platform market share	33	– 19	– 25						
Number of applications	06	33	91	– 09					
Number of platform competitors	11	56	14	– 38	20				
Platform price	02	02	– 68	23	– 56	10			
Superstar release	18	18	– 02	16	06	11	01		
December dummy	57	01	– 02	– 03	– 01	10	02	– 04	
M	252,329	37	34 91	29	420 79	2 70	177 66	24	09
SD	322,275	19	26 22	20	423 82	84	94 13	55	29

B. Multihoming Equation

	Seller-Level Multihoming	Platform Age	Platform Market Share	Number of Applications^a	Seller–Platform Fit
Platform age	– 10				
Platform market share	– 06	– 33			
Number of applications	– 07	90	– 12		
Seller-platform fit	05	– 07	01	– 04	
M	27	48 43	28	654 90	64 48
SD	36	27 65	19	468 71	14 51

C· Number of Applications Equation

	Number of Applications (Seller Platform)^b	Platform Market Share	Number of Seller Competitors	Platform Age	December Dummy
Platform market share	– 03				
Number of seller competitors	22	– 11			
Platform age	20	– 33	90		
December dummy	–1 98e-04	– 01	7 07e-04	8 72e-06	
M	9 72	28	57 48	48 43	09
SD	17 87	19	24 20	27 65	28

[a] The number of applications on a given platform
[b] The number of a seller's applications on a given platform

Model

To test our hypotheses, we specify a system of equations as follows The dependent variable of the first equation (Platform_Sales$_{pt}$) is the sales of platform p at time t The dependent variable of the second equation (Seller_Multi_Homing$_{pst}$) is the extent to which applications of seller s for platform p are multihomed at time t We implement a log-transform functional form for these two dependent variables, which enables us to pool data across platforms with different platform-level multihoming and platform sales levels (Binken and Stremersch 2009, Dranove and Gandal 2003, Gandal, Kende, and Rob 2000, Stremersch et al 2007)

We specify the independent variables according to the theory we derived previously, using the symbols as introduced in the "Measures" section We do not enter the number of superstar title releases, Superstar_Release$_{pt}$, with a log-transform form, to allow for increasing returns to platform sales, consistent with superstar theory (Binken and Stremersch 2009, Jones and Walsh 1988) Finally, we include platform dummies $(\alpha_{0p}, \beta_{0p})$ in the two equations to account for unobserved platform characteristics

Because multihoming is a strategic decision between application sellers and platform owners (Choi 2007, Doganoglu and Wright 2010), we use Garen's (1984) approach (which has also been advocated in Hamilton and Nickerson [2003] and applied in Ghosh, Dutta, and Stremersch [2006]) In this approach, we include the residuals from estimating the equation of the strategic selection variable (in our case, seller-level multihoming) in the equation of the response variable (in our case, platform sales), as well as the interaction between each residual and the strategic selection variable

Because the number of applications for a platform might also be endogenous, we include an equation with nr_Applications$_{pst}$ as the dependent variable, in which we implement the same residual inclusion approach developed by Garen (1984) In addition, for this equation, we implement a log-transform functional form and take the specification for the independent variables most commonly used in the literature (Stremersch et al 2007)

The system of equations we specify is as follows

$$
\begin{aligned}
(4)\quad & \ln \text{Platform\_Sales}_{pt} \\
& = \alpha_{0p} + \alpha_1 \ln \text{Platform\_Multi\_Homing}_{pt} \\
& + \alpha_2 \ln \text{Platform\_Age}_{pt} + \alpha_3 (\ln \text{Platform\_Multi\_Homing}_{pt} \\
& \times \text{Platform\_Age}_{pt}) \\
& + \alpha_4 \ln \text{Platform\_Mar\_Share}_{pt-1} \\
& + \alpha_5 (\ln \text{Platform\_Multi\_Homing}_{pt} \\
& \times \ln \text{Platform\_Mar\_Share}_{pt-1}) \\
& + \alpha_6 \ln \text{nr\_Applications}_{pt} + \alpha_7 \ln \text{Platform\_Comp\_Nr}_{pt} \\
& + \alpha_8 \ln \text{Platform\_Price}_{pt} + \alpha_9 \text{Superstar\_Release}_{pt} \\
& + \alpha_{10} I_t^{\text{Dec}} + \alpha_{11} \ln \text{Platform\_Sales}_{pt-1} \\
& + \theta_1 \eta_{pt}^{\text{Multi\_Homing}} + \theta_2 (\eta_{pt}^{\text{Multi\_Homing}} \times \ln \text{Multi\_Homing}_{pt}) \\
& + \theta_3 \eta_{pt}^{\text{nr\_Applications}} + \theta_4 (\eta_{pt}^{\text{nr\_Applications}} \times \ln \text{nr\_Applications}_{pt}) \\
& + \varepsilon_{pt}^{\text{Platform\_Sales}},
\end{aligned}
$$

$$
\begin{aligned}
(5)\quad & \ln \text{Seller\_Multi\_Homing}_{pst} \\
& = \beta_{0p} + \beta_1 \ln \text{Platform\_Age}_{pt} + \beta_2 \ln \text{Platform\_Mar\_Share}_{pt-1} \\
& + \beta_3 (\ln \text{Platform\_Mar\_Share}_{pt-1} \times \ln \text{Platform\_Age}_{pt}) \\
& + \beta_4 \ln \text{nr\_Applications}_{pt-1} \\
& + \beta_5 \ln \text{Seller\_Platform\_Fit}_{pst} \\
& + \beta_6 \ln \text{Seller\_Multi\_Homing}_{pst-1} + \eta_{pt}^{\text{Multi\_Homing}} + \varepsilon_{pst}^{\text{Multi\_Homing}},
\end{aligned}
$$

and

$$
\begin{aligned}
(6)\quad & \ln \text{nr\_Applications}_{pst} \\
& = \gamma_{0p} + \gamma_1 \ln \text{Platform\_Mar\_Share}_{pt-1} \\
& + \gamma_2 \ln \text{Sellers\_Comp\_Nr}_{pt} + \gamma_3 \ln \text{Platform\_Age}_{pt} \\
& + \gamma_4 I_t^{\text{Dec}} + \gamma_5 \ln \text{nr\_Applications}_{pst-1} \\
& + \eta_{pt}^{\text{nr\_Applications}} + \varepsilon_{pst}^{\text{nr\_Applications}}
\end{aligned}
$$

Because the platform sales equation is at the platform level while the two other equations are at the platform–seller level, there is no direct way to account for common unobserved shocks affecting the system Therefore, we decompose the periodic error terms of these two platform–seller-level equations into a platform-level element ($\eta_{pt}^{\text{Multi\_Homing}}$ and $\eta_{pt}^{\text{nr\_Applications}}$) and a platform–seller-level element ($\varepsilon_{pst}^{\text{Multi\_Homing}}$ and $\varepsilon_{pst}^{\text{nr\_Applications}}$) We assume $\eta_{pt}^{\text{Multi\_Homing}}$ and $\eta_{pt}^{\text{nr\_Applications}}$ each have a multivariate normal distribution

$$
(7)\qquad \begin{pmatrix} \eta_{pt}^{\text{Multi\_Homing}} \\ \eta_{pt}^{\text{nr\_Applications}} \end{pmatrix} \sim N(0, \Sigma_\eta)
$$

We then introduce $\eta_{pt}^{\text{Multi\_Homing}}$ and $\eta_{pt}^{\text{nr\_Applications}}$ concurrently in the sales equation, both as fixed effects and through interaction terms with the values of their corresponding independent variables In addition, θ_1, θ_2, θ_3, and θ_4 in Equation 4 correct for possible endogeneity in the effect of multihoming and number of applications on platform sales due to strategic behavior in setting these variables The terms θ_1 and θ_3 represent the effect of strategic deviations in the endogenous variables on the sales of the platform The strategic deviations are represented by the differences between the actual value of the variables and their expected values as they are captured by the respective equations The terms θ_2 and θ_4 in Equation 4 represent the effect of the interaction between these differences and the absolute values of the endogenous variables on platform sales

Model Estimation

Following the estimation approach of Garen (1988), we compute the residuals $\hat{\eta}_{pt}^{\text{Multi\_Homing}}$ and $\hat{\eta}_{pt}^{\text{nr\_Applications}}$ from the equations for multihoming and for the number of applications (Equations 5 and 6, respectively) by calculating for each platform and time period the average of $\hat{\varepsilon}_{pst}^{\text{Multi\_Homing}}$ and $\hat{\varepsilon}_{pst}^{\text{nr\_Applications}}$ over all sellers in that time period Then, we include these residuals as regressors in Equation 4, along with their interactions with the corresponding endogenous independent variables

As Garen (1988) notes, the error term in Equation 4, $\varepsilon_{pt}^{\text{Platform\_Sales}}$, is likely to depend on the endogenous variables (in our case, $\text{Platform\_Multi\_Homing}_{pt}$ and $\text{nr\_Applications}_{pt}$) and thus may be heteroskedastic Therefore, we estimate heteroskedasticity-consistent standard errors as proposed by White (1980)

A final endogeneity concern arises with the estimation of α_8, the effect of platform price on platform sales Platform owners may set prices strategically to achieve superior sales Consequently, these decisions may not be random but rather may be rooted in the expectations managers have regarding their effect on future outcomes To address the potential endogeneity of price, we employ an instrumental variables (IV) procedure We use a combination of two IVs in our analysis that have also been used in other studies analyzing platform sales in the video game industry (Clements and Ohashi 2005, Corts and Lederman 2009) The first IV is the price of the platform in Japan This is a valid IV under the assumption that there are no common demand shocks in the U S and Japanese markets, which seems reasonable Second, we use the exchange rate between the U S dollar and the currency in the country in which the platform was manufactured As the U S dollar becomes stronger relative to the currency in the manufacturing country, the cost of the platform, and in turn its price in the U S market, is expected to decrease This variable is a valid IV if the exchange rates are not correlated with unobserved demand shocks for the platform in the U S market, which seems to be a reasonable assumption

Empirically, the two IVs adhere to the two requirements for instrumental variables First, they correlate with the endogenous explanatory variable, conditional on the other covariates In a regression explaining own platform price using the other model covariates and our set of IVs, the significance levels are 03 and 06 for the price in Japan and the exchange rate, respectively Second, they are not highly correlated with the error term in our investigated model

Results

Estimation Results

First, our model shows a good fit to the data, which is not surprising, given that we include all key variables and the lagged dependent variable ($R^2_{(\text{platform sales equation})} = 76$, $R^2_{(\text{seller-level multihoming equation})} = 96$, $R^2_{(\text{number of applications equation})} = 98$) Table 2 reports the estimation results for Equations 4–6 The estimation results of the first equation are in Columns 1–3 (variable name, symbol, and coefficient with standard error in parentheses), followed by the estimation results of the second (Columns 4–6) and third (Columns 7–9) equations

Columns 1–3 in Table 2 show that the coefficient for the main effect of platform-level multihoming is negative, indicating that higher levels of platform-level multihoming lead to lower own-brand sales ($\alpha_1 = -4\ 98$, $p \leq\ 01$) Confirming H_1 and H_2, we also find that this negative effect is mitigated by the age of the platform ($\alpha_3 =\ 05$, $p \leq\ 01$) and by its market share ($\alpha_5 = 2\ 84$, $p \leq\ 01$) Given the significant interactions of platform-level multihoming with platform age and market share, we need to account for the latter factors when testing the overall effect of multihoming, which we can do by calculating the elasticity of multihoming at the mean levels of age, market share, and the estimated error of the multihoming equation[5] This elasticity is $-2\ 71$, confirming that, on average, platform-level multihoming negatively affects platform sales

The number of applications for the platform has a positive effect on platform sales ($\alpha_6 =\ 22$, $p \leq\ 01$) The elasticity of the number of applications is only 22 That is, an increase of 1% in the number of applications for a platform will lead to an increase of 22% in platform sales A comparison of elasticities allows us to conclude that the (negative) elasticity of multihoming on platform sales (–2 71) is much larger than the (positive) elasticity of the number of applications on platform sales (22)

Furthermore, the number of competing platforms does not have a statistically significant effect on platform sales ($\alpha_7 = -\ 01$, $p =\ 90$) We find that platform price has a significantly negative effect on platform sales ($\alpha_8 = -1\ 70$, $p \leq\ 05$), while the number of new superstar releases ($\alpha_9 =\ 11$, $p \leq\ 01$), the December dummy ($\alpha_{10} =\ 95$, $p \leq\ 01$), and lagged platform sales ($\alpha_{11} =\ 17$, $p \leq\ 01$) each have a significantly positive effect on platform sales

Among the four parameters that correct for sample selection with respect to the extent of multihoming and number of applications (θ_1, θ_2, θ_3, and θ_4), we find that only θ_2 is significantly different from zero ($\theta_2 = 6\ 74$, $p \leq\ 05$) This significant coefficient implies strategic behavior in setting multihoming levels However, we do not find evidence of such strategic behavior with respect to the number of applications, probably because developing new applications in this market takes 12–18 months on average

The estimation results for the seller-level multihoming model (Columns 4–6) show that, in line with our theoretical expectation, the extent to which sellers multihome their applications for a given platform is likely to increase as the platform ages ($\beta_1 = 1\ 71\text{e-}04$, $p \leq\ 01$) The market share of a given platform has a negative main effect on the extent of seller-level multihoming on that platform ($\beta_2 = -\ 05$, $p \leq\ 01$) Given the signs of the main effect of platform market share and its significant interaction with platform age ($\beta_3 = 1\ 23\text{e-}03$, $p \leq\ 01$), we calculate the elasticity of platform market share across the range of Platform_Age_{pt} to test H_3 We find that until the 44th time period (3 5 years), the elasticity of platform market share on seller-level multihoming is negative, after which it turns positive, confirming H_3 We also find that the fit between a seller and a platform has a significant, negative effect on the extent to which that seller multihomes for that platform ($\beta_5 = -\ 01$, $p \leq\ 01$), confirming H_4 The number of applications for the platform does not have a significant effect on the extent of seller-level multihoming for the platform ($\beta_4 = -\ 02$, $p =\ 09$) Finally, we find that seller-level multihoming shows a high level of inertia, given the significant lagged term ($\beta_6 =\ 98$, $p \leq\ 01$)

The estimation results for the model of the number of applications (Columns 7–9) show that the lagged market share of the platform ($\gamma_1 =\ 10$, $p \leq\ 01$), the age of the platform ($\gamma_3 = 1\ 85\text{e-}04$, $p =\ 07$), the December dummy ($\gamma_4 =\ 01$, $p \leq\ 01$), and the lagged number of applications ($\gamma_5 =\ 98$, $p \leq\ 01$) each have a positive effect on the number of applications that are released for the platform by a given seller The level of competition among sellers on a platform has a negative effect on the number of applications released for the platform by a given seller ($\gamma_2 = -\ 05$, $p \leq\ 01$)

Robustness

We assessed the robustness of our results in many ways (for a summary of all robustness checks, see Table 3) First, we constructed alternative multihoming measures from alternative specifications of Home_{at} (Equation 1) based on various concentration measures (for more details, see the Web Appendix at http //www marketingpower com/jmnov11), such as the Herfindahl index, the Rosenbluth index, and the comprehensive concentration index We also used the number of titles that are multihomed as an alternative measure Our main estimation results remained the same across all these alternative measures Second, we estimated a nonlinear effect of platform-level multihoming on platform sales by introducing a squared multihoming term to our full model We find that the squared multihoming effect is positive and significant, and yet the marginal effect of multihoming remains negative

Third, in addition to estimating the effects of platform-level multihoming across all platforms (as reported in Table 2), we estimated its effects for each platform separately by evaluating interactions between platform-level multihoming and platform dummies We find that the effect of platform-level multihoming on platform sales is negative and significant in the case of six consoles (i e , 3DO Multiplayer,[6] Sega Saturn, Nintendo 64, Sega Dreamcast, Nintendo GameCube, and Microsoft Xbox) and insignificant in the case of six consoles (i e , Atari Jaguar, Sony PlayStation, Sony PlayStation 2, Microsoft Xbox 360, Sony PlayStation 3, and Nintendo Wii) Consistent with our theoretical expectations and model findings in Table 2, sales

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[5] Given the log-log specification of our model, we calculate the elasticity as follows

$$\begin{aligned} E_{\text{Platform\_Multi\_Homing}_{pt}} &= \alpha_1 + \alpha_3 \times \overline{\ln \text{Platform\_Age}_{pt}} \\ &+ \alpha_5 \times \overline{\ln \text{Platform\_Mar\_Share}_{pt-1}} \\ &+ \theta_2 \times \overline{\eta^{\text{Multi\_Homing}}_{pt}} \end{aligned}$$

[6] The significance level for 3DO Multiplayer is slightly lower ($p =\ 94$)

TABLE 2
Estimation Results

Platform Sales Equation			Seller Multihoming Equation			Number of Applications Equation		
Variable	Symbol	Coefficient (SE)	Variable	Symbol	Coefficient (SE)	Variable	Symbol	Coefficient (SE)
Platform_Multi_Homing$_{pt}$	α_1	–4.98** (1.57)	Platform_Age$_{pt}$	β_1	1.71e-04** (.00)	Platform_Mar_Share$_{pt-1}$	γ_1	.10** (.01)
Platform_Age$_{pt}$	α_2	–.05* (.02)	Platform_Mar_Share$_{pt-1}$	β_2	–.05** (.0068)	Seller_Comp_Nr$_{pt}$	γ_2	–.05** (.01)
Platform_Multi_Homing$_{pt}$ × Platform_Age$_{pt}$	α_3	.05** (.02)	Platform_Mar_Share$_{pt-1}$ × Platform_Age$_{pt}$	β_3	1.23e-03** (.00)	Platform_Age$_{pt}$	γ_3	1.85e-04 (.00)
Platform_Mar_Share$_{pt-1}$	α_4	–.23 (.37)	nr_Applications$_{pt}$	β_4	–.02 (.01)	December dummy	γ_4	.01** (.00)
Platform_Multi_Homing$_{pt}$ × Platform_Mar_Share$_{pt-1}$	α_5	2.84** (1.08)	Seller_Platform_Fit$_{pst}$	β_5	–.01** (.00)	nr_Applications$_{pst-1}$	γ_5	.98** (.00)
nr_Applications$_{pt}$	α_6	.22** (.06)	Seller_Multi_ Homing$_{pst-1}$	β_6	.98** (.00)			
Platform_Comp_Nr$_{pt}$	α_7	–.01 (.11)						
Platform_Price$_{pt}$	α_8	–1.70* (.88)						
Superstar_Release$_{pt}$	α_9	.11** (.03)						
December dummy	α_{10}	.95** (.08)						
Platform_Sales$_{pt-1}$	α_{11}	.17** (.05)						
Atari Jaguar	α_{01}	9.13 (4.80)	Atari Jaguar	β_{01}	.08** (.01)	Atari Jaguar	γ_{01}	.17** (.02)
Sega Saturn	α_{02}	9.97* (5.08)	Sega Saturn	β_{02}	.12** (.01)	Sega Saturn	γ_{02}	.23** (.02)
3DO Multiplayer	α_{03}	9.95 (5.21)	3DO Multiplayer	β_{03}	.10** (.01)	3DO Multiplayer	γ_{03}	.20** (.02)
Sony PlayStation	α_{04}	1.34* (4.98)	Sony PlayStation	β_{04}	.12** (.01)	Sony PlayStation	γ_{04}	.21** (.02)
Nintendo 64	α_{05}	9.97* (4.74)	Nintendo 64	β_{05}	.10** (.01)	Nintendo 64	γ_{05}	.19** (.02)
Sega Dreamcast	α_{06}	9.28* (4.63)	Sega Dreamcast	β_{06}	.11** (.01)	Sega Dreamcast	γ_{06}	.22** (.02)
Nintendo GameCube	α_{07}	1.17* (4.88)	Nintendo GameCube	β_{07}	.12** (.01)	Nintendo GameCube	γ_{07}	.21** (.02)
Sony PlayStation2	α_{08}	11.40* (5.34)	Sony PlayStation2	β_{08}	.13** (.01)	Sony PlayStation2	γ_{08}	.21** (.02)
Microsoft Xbox	α_{09}	1.96* (5.25)	Microsoft Xbox	β_{09}	.13** (.01)	Microsoft Xbox	γ_{09}	.22** (.02)
Microsoft Xbox 360	α_{010}	11.93* (5.60)	Microsoft Xbox 360	β_{10}	.12** (.01)	Microsoft Xbox 360	γ_{10}	.22** (.02)
Sony PlayStation3	α_{011}	12.95* (6.08)	Sony PlayStation3	β_{11}	.14** (.01)	Sony PlayStation3	γ_{11}	.25** (.02)
Nintendo Wii	α_{012}	11.71* (5.40)	Nintendo Wii	β_{12}	.13** (.01)	Nintendo Wii	γ_{12}	.26** (.02)
$\eta_{pt}^{\text{Multi\_Homing}}$	θ_1	.50 (.63)						
$\eta_{pt}^{\text{Multi\_Homing}}$ × Multi_Homing$_{pt}$	θ_2	6.74* (2.86)						
$\eta^{\text{nr\_Applications}}$	θ_3	–2.42 (1.71)						
$\eta^{\text{nr\_Applications}}$ × nr_Applications$_{pt}$	θ_4	.64 (.46)						
R^2		.76			.96			.98

*$p < .05$
**$p < .01$
Notes: The "pst" subscript represents the periodic platform–seller level. That is, a variable with this subscript is defined over all applications of seller s for platform p at time t. For example, nr_Applications$_{pst}$ is the number of applications of seller s available for platform p at time t. The "pt" subscript represents the periodic platform level. That is, a variable with this subscript is defined for platform p at time t. For example, nr_Applications$_{pt}$ is the number of applications available for platform p at time t.

TABLE 3
Robustness Analysis: Summary

Variable	Alternative Measure Construction	Alternative Effect Specification	Additional Effects
Multihoming	Multihoming measure based on the Herfindahl index Multihoming measure based on the Rosenbluth index Multihoming measure based on the comprehensive concentration index Multihoming measure based on the number of titles that are multihomed	Including interactions between platform dummies and platform multihoming on platform sales	Nonlinear effect of platform-level multihoming
Seller–platform fit	Quality-based seller–platform fit measure, instead of sales-based measure		
Platform price	Platform-applications package price Average competitive price Average price of competitors as an instrument for price	Price not instrumented	
Platform age			Including a moderating effect of the number of platforms on the impact of platform age on platform sales
Endogeneity			Estimation of a simpler model of platform sales that does not control for the potential endogeneity of multihoming and number of applications

of the smaller platforms are negatively affected by multihoming, while sales of the larger platforms are not. Fourth, we explored whether the number of competitors moderates the impact of age of the platform on platform sales. It does not, and all other results are robust to the inclusion of such an interaction effect.

Fifth, we tried estimating our model using a quality-based measure rather than a sales-based measure to represent seller–platform fit, which we evaluate as a potential factor affecting the extent of multihoming of that seller's applications for that platform. The alternative measure takes into account the quality ratings of the seller's applications for a given platform compared with their quality ratings on competing platforms. We find that the effect of the quality-based fit measure is insignificant. Therefore, on the basis of our estimation using a sales-based measure for seller–platform fit, we conclude that sellers and platform owners do seem to make single-homing decisions that are based on fit, and yet it appears that their assessment regarding fit is established through application sales rather than application quality ratings.

Sixth, we tested alternative specifications for price, such as a model that includes platform price not-instrumented and a model that includes a platform-applications package price not-instrumented. Note that the latter price is not entirely under the control of platform owners and thus not endogenous per se, because it also includes the average price of applications for the platform and the number of applications an average platform buyer purchases during the three months after buying the platform. In addition, we estimated the model using the average price of competitors as an instrument for price.[7] The estimation results of these three other models are similar to the results reported in Table 2.

Seventh, we also estimated a simpler model of platform sales that does not control for the potential endogeneity of multihoming and number of applications. This simpler model provides similar results to those reported in Table 2. Finally, the correlation tables presented in Table 1 indicate that some bivariate correlations are high. More specifically, there is evidence for a high correlation between the age of the platform and the number of applications (.91). This correlation is expected, given that the number of applications is measured as the periodic cumulative number of titles released for the platform.[8] Table 1, Panel A, also shows a negative correlation between price and age of the platform (–.68), because prices drop as the platform ages. It is well known that collinearity between regressors does not generate bias in coefficients, but it may inflate the standard errors around coefficient estimates. Thus, although we can make an unbiased inference on the theoretical expectations developed here, this inference is conservative in the sense that insignificant coefficients may be caused by collinearity between regressors. However, the results we report show many significant effects, easing potential concerns about multicollinearity. We also performed a simulation exercise in which we estimated our model's parameters 100 times. In each step of the simulation, we used a random subset of our data (roughly 90%) to estimate the model. We found our parameter estimates to be stable at similar significance levels as reported in Table 2, further easing potential multicollinearity concerns.

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[7] We also estimated a model with average competitive price as an independent variable to investigate the exclusion restriction criteria for this variable and found it to have an insignificant effect on platform sales ($p = .94$). The other estimation results remain stable.

[8] Note that in our model, we implement a log–log transformation that slightly lowers the level of collinearity between these two variables to .835.

Discussion

Despite the high relevance of multihoming decisions in many two-sided markets, the determinants of the multihoming decision and its effect on platform sales have received little empirical attention from academics. In the current study, we address this gap theoretically and empirically. We are the first to separately model and estimate the effects of the number of applications and of platform-level multihoming on platform sales, including platform age and market share as moderators. We are also the first to explicitly model sellers' decisions to multihome their applications for a given platform. Thus, we are able to provide novel insights for marketing managers, industry observers, and academic scholars. In this section, we first summarize our main findings and then discuss their implications. We conclude with a discussion of the limitations of the current study and directions for further research.

Summary of Findings

We find that the (negative) effect of platform-level multihoming on platform sales is larger than the (positive) effect of the number of applications on platform sales. However, thus far, prior research on network benefits in two-sided markets has focused almost exclusively on the effect of the number of applications on platform sales, utility, or demand. We also find that the negative effect of platform-level multihoming on platform sales is prominent for nascent platforms and platforms with a small market share but fades as platforms mature and gain market share.

Moreover, we find that a platform's age and market share, among other factors, drive the extent of seller-level multihoming. On the one hand, the larger the market share of a mature platform among buyers, the more applications for it will be multihomed. On the other hand, the larger the market share of a nascent platform, the fewer applications for it will be multihomed.

Implications

In view of our empirical findings regarding the effect of multihoming on platform sales and how it compares with the effect of number of applications on platform sales, the owners of nascent platforms and platforms with a small market share should attach greater importance to the extent to which applications for their platform are multihomed and move away from mere network size considerations. Academic scholars should also move away from the logic of network size in their study of two-sided markets, which has dominated the marketing and economics literatures for decades. These findings are also relevant for industry analysts, who commonly track the total number of sellers for a platform but underreport on the extent of multihoming across platforms.

For mature platforms and platforms with a large market share, the preceding conclusions do not apply. This may explain why applications are increasingly multihomed in the video game console market (see Figure 2), a phenomenon seemingly at odds with differentiation literature. With the maturation of consoles of large players (Microsoft, Sony, and Nintendo), the negative consequences of multihoming may fade, and from a sales perspective, it makes little sense for such firms to invest in reducing the level of multihoming for their applications at a later stage in the consoles' life cycle.

Our research findings also have substantial implications for sellers. For example, a seller's decision to design content that fits better with the tastes of buyers of a larger market share platform and less well with others is less risky when that platform is "young," because sellers are more likely to obtain single-homing offers early on, whereas as a large-market-share platform matures, owners' willingness to pay for single-homing will fade.

Although the industry practice seems on track, these findings also allow observers of two-sided markets to better understand and assess company decision making. For example, Nintendo's market share deteriorated substantially in the sixth generation with the GameCube. Moreover, game publishers invested relatively little in increasing the fit of their applications with this platform, given the limited user base. Therefore, Nintendo needed single-homed applications for the Wii, despite application publishers' lack of success for GameCube, to establish a lead in the seventh generation. Now that Nintendo has established the dominance of the Wii, our findings would imply that Nintendo can once again increase the extent to which its applications are multihomed.

The findings in this study may also help to explain, for example, the disappointing performance of Sony PlayStation3 in overall sales compared with other seventh-generation consoles (Brightman 2008). This console reached a multihoming level of almost .6 within one month after its introduction for a relatively small number of applications (17 games). The level of multihoming for the PlayStation3 has steadily increased over time to more than .75 in April 2008, which is the highest level of multihoming reached by any console in our data. The high level of multihoming for PlayStation3, and especially that with the incumbent Xbox 360, probably led to a lack of differentiation for the console on applications that consequently hurt its initial sales.[9] (Nascent platforms are hurt more by multihoming than maturing platforms are.)

Other markets for which researchers could build on our insights include the following: 3-D television (e.g., the importance of exclusivity deals between platform companies, such as Samsung, and movie studios), application stores (e.g., the competition between the "open" application world Google is promoting and the "closed" application world Apple has developed), and smart payment (e.g., the competition between new payment platforms through mobile devices and the multihoming decisions retailers will make across competing platforms and existing platforms, such as cash, debit cards, and credit cards)

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[9] Of the 14 games available for PlayStation3 at introduction, 8 were also available for the Xbox 360, including the popular games *Madden NFL 07*, which had already been available for the Xbox 360 since August 2006, and *Call of Duty 3*. Of the 17 games available for PlayStation3 within one month after its introduction, 10 were also available for the Xbox 360.

Limitations and Directions for Further Research

The current study also has limitations that may direct further research First, although the data we employ are rich, spanning different generations over 13 years on a monthly periodicity, the empirical analysis focuses on only one industry Further research could examine the extent to which these market dynamics also exist outside the video game console market

Second, our model includes fixed effects for the 12 platforms in our data set These fixed effects control for all variation across the platforms that is time invariant and not explicitly modeled, such as variation in brand name, data width, clock speed, memory, the type of controller, the media device (e g , CD-ROM, DVD, Blu-ray), and Internet access While our model yields unbiased estimates given the (indirect) inclusion of such technology features in the fixed effects, it does not illuminate the effect of console enhancements on platform sales Research that examines this issue would be most valuable However, such research would need a richer collection of devices (e g , studying the video game industry from its inception, or even better, a different market with a greater variety of devices) and a strong taxonomy to classify types of technological advancements

Third, our model presents a first exploration of multihoming across the platform life cycle, and it shows that platform age is an important consideration for managers involved in or affected by multihoming decisions However, the dynamics present in the market are, likely, much richer than age can proxy for Further research that disentangles the many correlates of age may lead to interesting insights that are actionable for managers (e g , the competitive growth of applications across multiple platforms) The main challenges for such a research endeavor are endogeneity and multicollinearity

Fourth, in this study, we do not distinguish between multihomed applications for a platform that were previously single-homed on that platform (i e , losing a single-homed application) and multihomed applications for a platform that were previously single-homed on a competing platform (i e , gaining a multihomed application) Further research that makes such distinction—for example, by studying superstar applications that switch between being single-homed and multihomed—could lead to useful findings (e g , by modeling the effect of such switches [i e , as events] on platform sales)

Fifth, our model examines one main aspect that is relevant to marketers—namely, the effect of multihoming on platform sales More work remains to be done to fully inform marketing managers in two-sided markets such that they will be able to make optimal decisions Consider advertising decisions (Tucker and Zhang 2010) Should sellers or platform owners in two-sided markets advertise the extent to which they promote single-homing? While the iPhone was exclusively available to AT&T users, Apple and AT&T have communicated with one voice about Apple's commitment to single-home its iPhone on AT&T Verizon attempted to counteract this partnership between AT&T as a platform and Apple as a seller, consequently leading to an advertising war (MacMillan and Satariano 2010, Raice and Kane 2011)

Sixth, in this article, we examine only seller-level multihoming A possible path for further research would be to examine buyer-level multihoming For example, what are the consequences of buyer-level multihoming for application buying behavior? Do buyers have a fixed budget? What drives budget allocation decisions in application purchasing across the multiple platforms that buyers use?

Further research endeavors may include the pricing of single-homing contracts between sellers and platform owners, the implications of multihoming or single-homing for the competitive strategies of both platform owners and sellers, and the channel decisions application sellers can make beyond choosing to supply applications to a certain platform (i e , a seller's decision to single-home on a given platform does not necessarily imply that the only channel to the market available to the seller is that platform owner)

Further research—probably of an analytic nature because of a lack of data on costs and fees—could investigate profitability implications of multihoming Such a study must take into account the costs required for the development of new applications and for application migration, because both types of costs have implications for side payments between sellers and platform owners While development costs can be viewed as exogenous to platform owners, the owners do have some level of control over application migration costs

Other avenues for further research are the role of vertical integration between sellers and platform owners and the role of multihoming in the incentives for both platform owners and sellers to innovate Most importantly, further empirical and theoretical research should move beyond the influence of mere network size in the analysis of two-sided markets, which has dominated this literature for far too long

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Oliver Hinz, Bernd Skiera, Christian Barrot, & Jan U. Becker

Seeding Strategies for Viral Marketing: An Empirical Comparison

Seeding strategies have strong influences on the success of viral marketing campaigns, but previous studies using computer simulations and analytical models have produced conflicting recommendations about the optimal seeding strategy. This study compares four seeding strategies in two complementary small-scale field experiments, as well as in one real-life viral marketing campaign involving more than 200,000 customers of a mobile phone service provider. The empirical results show that the best seeding strategies can be up to eight times more successful than other seeding strategies. Seeding to well-connected people is the most successful approach because these attractive seeding points are more likely to participate in viral marketing campaigns. This finding contradicts a common assumption in other studies. Well-connected people also actively use their greater reach but do not have more influence on their peers than do less well-connected people.

Keywords: viral marketing, seeding strategy, word of mouth, social contagion, targeting

The future of traditional massmedia advertising is uncertain in the modern environment of increasingly prevalent digital video recorders and spam filters. Marketers must realize that 65% of consumers consider themselves overwhelmed by too many advertising messages, and nearly 60% believe advertising is not relevant to them (Porter and Golan 2006). Such information overload can cause consumers to defer their purchase altogether (Iyengar and Lepper 2000), and strong evidence indicates consumers actively avoid traditional marketing instruments (Hann et al. 2008).

Other empirical evidence also reveals that consumers increasingly rely on advice from others in personal or professional networks when making purchase decisions (Hill, Provost, and Volinsky 2006; Iyengar, Van den Bulte, and Valente 2011; Schmitt, Skiera, and Van den Bulte 2011). In particular, online communication appears increasingly important as more websites offer user-generated content, such as blogs, video and photo sharing opportunities, and online social networking platforms (e.g., Facebook, LinkedIn). Companies have adapted to these trends by shifting their budgets from above-the-line (mass media) to below-the-line (e.g., promotions, direct mail, viral) marketing activities.

Not surprisingly then, viral marketing has become a hot topic. The term "viral marketing" describes the phenomenon by which consumers mutually share and spread marketing-relevant information, initially sent out deliberately by marketers to stimulate and capitalize on word-of-mouth (WOM) behaviors (Van der Lans et al. 2010). Such stimuli, often in the form of e-mails, are usually unsolicited (De Bruyn and Lilien 2008) but easily forwarded to multiple recipients. These characteristics parallel the traits of infectious diseases, such that the name and many conceptual ideas underlying viral marketing build on findings from epidemiology (Watts and Peretti 2007).

Because viral marketing campaigns leave the dispersion of marketing messages up to consumers, they tend to be more cost efficient than traditional massmedia advertising. For example, one of the first successful viral campaigns, conducted by Hotmail, generated 12 million subscribers in just 18 months with a marketing budget of only $50,000. Google's Gmail captured a significant share of the e-mail provider market, even though the only way to sign up for the service was through a referral. A recent viral advertisement by Tipp-Ex ("A hunter shoots a bear!") triggered nearly 10 million clicks in just four weeks.

However, to enjoy such results, firms must consider four critical viral marketing success factors: (1) content, in that the attractiveness of a message makes it memorable (Berger and Milkman 2011; Berger and Schwartz 2011; Gladwell 2002; Porter and Golan 2006), (2) the structure of the social

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network (Bampo et al 2008), (3) the behavioral characteristics of the recipients and their incentives for sharing the message (Arndt 1967), and (4) the seeding strategy, which determines the initial set of targeted consumers chosen by the initiator of the viral marketing campaign (Bampo et al 2008, Kalish, Mahajan, and Muller 1995, Libai, Muller, and Peres 2005) This last factor is of particular importance because it falls entirely under the control of the initiator and can exploit social characteristics (Toubia, Stephen, and Freud 2010) or observable network metrics Unfortunately, there is a "need for more sophisticated and targeted seeding experimentation" to gain "a better understanding of the role of hubs in seeding strategies" (Bampo et al 2008, p 289)

The conventional wisdom adopts the influentials hypothesis, which states that targeting opinion leaders and strongly connected members of social networks (i e , hubs) ensures rapid diffusion (for a summary of arguments, see Iyengar, Van den Bulte, and Valente 2011) However, recent findings raise doubts Van den Bulte and Lilien (2001) show that social contagion, which occurs when adoption is a function of exposure to other people's knowledge, attitudes, or behaviors (Van den Bulte and Wuyts 2007), does not necessarily influence diffusion, and yet it remains a basic premise of viral marketing Such contagion frequently arises when people who are close in the social structure use one another to manage uncertainty in prospective decisions (Granovetter 1985) However, in a computer simulation, Watts and Dodds (2007) show that well-connected people are less important as initiators of large cascades of referrals or early adopters Their finding, which Thompson (2008) provocatively summarizes by implying "the tipping point is toast," has stimulated a heated debate about optimal seeding strategies, though no research offers an extensive empirical comparison of seeding strategies Van den Bulte (2010) thus calls for empirical comparisons of seeding strategies that use sociometric measures (i e , metrics that capture the social position of people)

In response, we undertake an empirical comparison of the success of different seeding strategies for viral marketing campaigns and identify reasons for variations in these levels of success In doing so, we determine whether companies should care about the seeding of their viral marketing campaigns and why In particular, we study whether well-connected people really are more difficult to activate, participate more actively in viral campaigns, and have more influence on their peers than less well-connected people In contrast with previous studies that rely on analytical models or computer simulations, we derive our results from field experiments and from a real-life viral marketing campaign

We begin this article by presenting literature relevant to viral marketing and social contagion theory We introduce our theoretical framework, which disentangles the determinants of social contagion, and present four seeding strategies Next, we empirically compare the success of these seeding strategies in two complementary field experiments (Studies 1 and 2) that aim at spreading information and inducing attitudinal changes Then, we analyze a real-life viral marketing campaign designed to increase sales, which provides an economic measure of success After we identify the determinants of success, we conclude with a discussion of our research contributions, managerial implications, and limitations

Theoretical Framework

When information about an underlying social network is available, seeding on the basis of this information, as typically captured by sociometric data, seems promising (Van den Bulte 2010) Such a strategy can distinguish three types of people "hubs," who are well-connected people with a high number of connections to others, "fringes," who are poorly connected, and "bridges," who connect two otherwise unconnected parts of the network The sociometric measure of degree centrality captures connectedness within the local environment (for details, see the Web Appendix at http //www marketingpower com/jmnov11), such that high-degree-centrality values characterize hubs, whereas low-degree-centrality values mark fringes In contrast, the sociometric betweenness centrality measure describes the extent to which a person acts as a network intermediary, according to the share of shortest communication paths that pass through that person (see the Web Appendix) Thus, bridges earn high values on betweenness centrality measures

Determinants of Social Contagion

Following Van der Lans et al (2010), we propose a four-determinant model of social contagion to determine the success of viral marketing campaigns First, individual i receives a viral message from sender s, who can be either a friend or the campaign initiator that makes i aware of and informed by the message with information probability I_i Individual i then may become active and participate in the campaign with participation probability P_i Given participation, individual i passes the message to a set of recipients J_i, where n_i is the number of recipients ($|J_i| = n_i$), such that it provides a measure of used reach The number of expected referrals R_i by individual i, then, is the product of the information probability (I_i), the probability of participating (P_i), and the used reach (n_i) $R_i = I_i \times P_i \times n_i$

The conversion rate $w_{i,j}$ linearly influences the number of expected successful referrals SR_i of individual i on recipients j ($j \in J_i$), given by

$$SR_i = I_i \times P_i \times n_i \times \sum_{j=1}^{n_i} \frac{w_{i,j}}{n_i} \tag{1}$$

If a sender i has the same conversion rate for all recipients, such that $w_{i,j} = w_i \; \forall j \in J_i$, the number of expected successful referrals can be rewritten as

$$SR_i = I_i \times P_i \times n_i \times w_i \tag{2}$$

All these determinants are a function of i's social position, though they also may be influenced by the characteristics of the sender s and the conversion rate w_s Despite the lack of empirical comparisons of seeding strategies for viral marketing campaigns, various studies in marketing, sociology, and epidemiology have analyzed the influence of the social position (captured by sociometric measures) on different determinants, such as whether hubs are more likely to persuade their peers In Table 1, we summarize these findings according to the determinants of information probability I_i, participation probability P_i, used reach n_i, and conversion rate w_i

TABLE 1
Previous Research

			Social Position Has Positive Influence on						
Studies	**Context**	**Reason for Contagion**	**Participation Probability P_i**	**Used Reach n_i**	**Expected Number of Referrals R_i**	**Conversion Rate w_i**	**Expected number of Successfull SR_i**	**Recommendation for Optimal Seeding Strategy**	**Empirically Tested Seeding Strategy**
Coleman, Katz, and Menzel (1966)	Product (low risk)	A, BU, NP	Hub		Hub			Hub	
Becker (1970)	Product (low risk)	A, BU, NP	Hub		Hub			Hub	
	Product (high risk)		Fringe		Fringe			Fringe	
Simmel (1950), Porter and Donthu (2008)	Messages	A	Fringe					Fringe	
	Messages	A							
Watts and Dodds (2007)	—	—	Fringe	Hub	Fringe		Fringe	Fringe	
Leskovec, Adamic, and Huberman (2007)	Product (low risk)	A, BU	Hub	Hub	Hub	Fringe			
Anderson and May (1991), Kemper (1980)	Epidemiology	A		Hub	Hub		Hub	Hub	
	Epidemiology	A							
Granovetter (1973), Rayport (1996)	Messages	A		Bridge	Bridge			Bridge	
	Messages	A							
Iyengar, Van den Bulte, and Valente (2011)	Product (high risk)	A, BU			Hub	Hub	Hub	Hub	
Study 1	Messages	A	Controlled				✓		Hub, fringe, bridge random
Study 2	Messages	A					✓		Hub, fringe, bridge random
Study 3	Product (low risk)	A, BU	✓	✓	✓	✓	✓		Hub, fringe, random

Notes A = awareness, BU = belief updating, NP = normative pressure, and i = focal individual Expected number of referrals $R_i = P_i \times n_i$, Successful number of referrals $SR_i = w_i \times R_i$

Effect of social position on information and participation probability A viral marketing campaign aims to inform consumers about the viral marketing message and to encourage them to participate in the campaign by sending the message to others In investigating the impact of social position on information probability, Goldenberg et al (2009) indicate that hubs tend to be better informed than others because they are exposed to innovations earlier through their multiple social links In his reanalysis of Coleman, Katz, and Menzel's (1966) medical innovation study, Burt (1987) also recognizes that some people experience discomfort when peers whose approval they value adopt an innovation they have not yet adopted, in this case, social contagion (reflected in a greater probability to participate) results from normative pressure and status considerations This mechanism could explain why Coleman, Katz, and Menzel (1966) find that highly integrated people (e g , hubs) are more likely to adopt an innovation early than are more isolated people

However, in some cases, hubs do not adopt innovations first (Becker 1970), such as when the innovation does not suit the hub's opinion, which may mean that adoption occurs first at the fringes of the network (Iyengar, Van den Bulte, and Valente 2011) Another potential explanation of hubs' lower participation probability stems from information overload effects Because hubs are exposed to so many contacts, they possess a wealth of information and thus might be more difficult to activate (Porter and Donthu 2008, Simmel 1950) or less likely to participate in viral marketing campaigns Overall, information and participation probabilities remain difficult to disentangle, for the purposes of this study, we assume that all receivers of viral marketing messages are aware of them This assumption is likely to hold for our three empirical studies, and our main findings remain unchanged even when it does not The only difference is that the participation probability would also capture the probability that a person is informed (and thus aware) of the viral marketing campaign

Effect of social position on used reach Epidemiology studies indicate that hub constellations foster the spread of diseases (Anderson and May 1991, Kemper 1980), which suggests in parallel that hubs should be more attractive for seeding viral marketing campaigns However, it is unclear whether hubs actively and purposefully make use of their potential reach The deliberate use of reach is a common assumption, and yet only Leskovec, Adamic, and Huberman (2007) actually confirm that hubs send more messages Furthermore, their definition of hubs relies on messaging behavior, such that it cannot offer generalizable evidence of the assumption that hubs actively use their greater reach potential

In contrast, we anticipate that individual i's used reach (first generation), added to the used reach of successive generations that originate from i's initial direct reach (second and further generations), which we call i's "influence domain" (Lin 1976), depends on the number of others who already have received the message In this setting, bridges are advantageous because they can forward the message to different parts of the network (Granovetter 1973) that have not yet been infected with the viral campaign

Effect of social position on conversion rate A person's social position might also indicate the degree of persuasiveness, as measured by the conversion rate—namely, the share of referrals that lead to successful referrals Iyengar, Van den Bulte, and Valente (2011) find that hubs are more likely to be heavy users and that, therefore, their influence is more effective, because they act in accordance with their own recommendations (e g , by making heavy use of the innovation) Leskovec, Adamic, and Huberman (2007) find that the success rate per recommendation decreases with the number of recommendations made, which implies that people have influence over a limited number of friends but not over everybody they know This result indicates that the conversion rate decreases when hubs use their full reach potential, though it does not preclude the notion that hubs instead might select relevant subsets of recipients from among their peers and thus achieve high conversion rates Thus, the effect of social position on the conversion rate remains unclear Goldenberg et al (2009) still make what they call the conservative assumption that hubs are not more persuasive than others, though without empirical support

Seeding Strategies

As our review in Table 1 shows, little consensus exists regarding recommendations for optimal seeding strategies Four studies recommend seeding hubs, three recommend fringes, and one recommends bridges We analyze these discrepant recommendations in turn

If at least one of the determinants I_i, P_i, n_i, or w_i increases with the connectivity of the sender i, and the remaining determinants are not correlated with higher connectivity, hubs should be the targets of initial seeding efforts, because they spread viral information best—as indicated in Hanaki et al (2007), Van den Bulte and Joshi (2007), and Kiss and Bichler (2008) Using hubs as initial seeding points implies a "high-degree seeding" strategy

In contrast, Watts and Dodds's (2007) computer simulations of interpersonal influence indicate that targeting well-connected hubs to maximize the spread of information works only under certain conditions and may be the exception rather than the rule They propose instead that a critical mass of influenceable people, rather than particularly influential people, drives cascades of influence The impact on triggering critical mass is not even proportional to the number of people who hubs directly influence, rather, according to Dodds and Watts (2004), the people most easily influenced have the highest impact on the diffusion Moreover, if hubs suffer from information overload because of their central position in the social network (Porter and Donthu 2008, Simmel 1950), they must filter or validate the vast amount of information they receive, such that they may be less susceptible to information received from anyone outside their trusted network In their analytical model, Galeotti and Goyal (2009) propose targeting low-degree members instead, on the fringe of the network, if the probability of adopting a product increases with the absolute number of adopting neighbors Sundararajan (2006) similarly suggests seeding the fringes rather than the hubs, which we refer to as a "low-degree seeding" strategy

When analyses focus on the influence domain, encompassing referrals beyond the first generation, it also becomes necessary to consider centrality beyond the local environment. Bridges who connect otherwise separated subnetworks have vast influence domains, such that seeding them might enable information to diffuse throughout parts of the network and prevent a viral message from simply circulating in an already infected, highly clustered subnetwork. Accordingly, Rayport (1996) recommends exploiting the strength of weak ties (i.e., bridges; Granovetter 1973) to spread a marketing virus. From an opposite perspective, Watts (2004) similarly recommends eliminating bridges to prevent epidemics. We thus refer to the idea of seeding bridges as a "high-betweenness seeding" strategy.

Finally, if there is no correlation between social position and the determinants I_i, P_i, n_i, and w_i, or if the opposing influences of the determinants nullify one another, there should be no differences across the proposed strategies or a random targeting. We also test this "random seeding" strategy, which further serves as a benchmark situation in which no information about the social network is available.

Method

We use three studies to empirically compare the success of seeding strategies and identify which of the determinants are influenced by the people's social position. Our three studies encompass two types of settings that are particularly relevant for viral marketing. First, viral marketing campaigns primarily aim to spread information, create awareness, and improve brand perceptions, which are noneconomic goals. Second, other campaigns attempt to increase sales through mutual information exchanges between adopters and prospective adopters, to trigger belief updating, such that we can use an economic measure of success.

These goals map well onto the classification that Van den Bulte and Wuyts (2007) provide to describe five reasons for social contagion, the first two of which are especially relevant for viral marketing campaigns. First, people may become aware of the existence of an innovation through WOM provided by previous adopters in a simple information transfer. Second, people may update their beliefs about the benefits and costs of a product or service. Third, social contagion may occur through normative pressures, such that people experience discomfort when they do not comply with the expectations of their peer group. Fourth, social contagion can be based on status considerations and competitive concerns (i.e., the level of competitiveness between two people). Fifth, complementary network effects might cause social contagion, in which the benefit of using a product or service increases with the number of users.

To examine both types of viral marketing campaigns, we conduct two experimental studies (Studies 1 and 2) that simulate viral marketing campaigns in which social contagion mainly involves simple information transfers and results in greater awareness as a noneconomic measure of success. The aim is to compare the success of different seeding strategies. In Study 3, we examine a viral marketing campaign in which social contagion relies on belief updating and results in sales (i.e., economic measure). In Table 2, we summarize the complementary setup of the three studies, which helps us overcome some individual limitations of each study.

Experimental Comparison of Seeding Strategies

In Studies 1 and 2, we compare the success of our four seeding strategies in different conditions and confirm the robustness of the results across different settings. Trusov, Bodapati, and Bucklin (2010) point out the neccessity to conduct such experiments. In analyzing data from a major social networking site, they find that only approximately one-fifth of a user's friends actually influence that user's activity on the site. However, they cannot discern how responsive the "top influencers" are or whether marketers should use information about underlying social networks to seed their viral marketing campaigns. Therefore, they call for further research that uses straightforward field experiments. Because such experiments can help identify best-practice strategies, we compare the four seeding strategies in two small-scale field experiments.

Study 1: Comparison of seeding strategies in a controlled setting. We begin with a controlled setup to ensure internal validity and control for willingness to actively participate P_i (see Table 1). We recruited 120 students from a German university. The recruitment and commitment processes ensured relatively similar participants in terms of communication activity across treatments because all of them expressed a willingness to contribute actively. Therefore, we expect minimal variation in activity levels, compared with a study in which respondents are unaware of their participation or do not come into direct contact with the experimenter. A prerequisite for participation was maintaining an account on a specified online social networking platform (similar to Facebook). Using proprietary software, we automatically gathered each participant's friends list from the platform and then applied an event-based approach to specify boundaries, such that we discarded all links to friends who did not participate in the experiment. The software Pajek calculated the sociometric measures (degree centrality and betweenness centrality; see the Web Appendix at http://www.marketingpower.com/jmnov11) for each participant.

The social network thus generated consisted of 120 nodes (i.e., participants) with 270 edges (i.e., friendship relations). Degree centrality ranged from 1 to 17, with a mean of 4.463 and a standard deviation of 3.362. In other words, the participants had slightly more than four friends each, on average, in the respective, bounded social network. The correlation (.592, $p < .01$) between the degree centrality in this small, bounded network created by the artificial boundary specification strategy (using the criteria "particpation in experiment") and the degree centrality of the entire network hosted by this social networking platform (6.2 million unique users, November 2009) is striking. It also supports Costenbader and Valente's (2003) claim that some centrality metrics are relatively robust across different network boundaries. That is, the boundary we applied does not appear to bias degree centrality, even for a sub sample that comprises as little as .002% of the entire social network. The betweenness centrality ranged from 0 to .320, with a standard deviation of .053.

We used these sociometric measures to implement our four seeding strategies. The seeding relied on the message function of the social networking platform, such that we sent unique tokens of information to a varying subset of participants (the total population remained unchanged throughout this experiment) and traced the contagion pro-

TABLE 2
Summary of Studies

	Study 1	Study 2	Study 3
Seeding strategies	Four seeding strategies •High degree (HD) •Low degree (LD) •High betweenness (HB) •Random (control)	Four seeding strategies •High degree (HD) •Low degree (LD) •High betweenness (HB) •Random (control)	Three seeding strategies •High degree (HD) •Low degree (LD) •Random
Social contagion through	Awareness (advertisement)	Awareness (advertisement)	Belief updating (service referral)
Motivation	Extrinsic motivation for sharing (experimental remuneration)	Intrinsic motivation (funny video about university)	Extrinsic motivation for sharing (additional airtime for referral)
Seeding size	10% of network size 20% of network size	7% of network size	Entire network
Seeding timing	Sequential	Parallel	—
Social network	120 nodes (small network), 270 edges	1380 nodes (medium-sized network), 4052 edges	208,829 nodes (very large network), 7,786,019 edges
Number of treatments	16 = 4 × 2 × 2	4	—
Number of replications	2 (4 treatments missing)	1	—
Number of experimental settings	28	4	—
Boundary of network	Artificial	Natural	Natural
Design strengths	Test of causality, strong control due to experimental setup, identification of individual behavior due to specific IDs	Test of causality, realistic scenario	Large real-world network based on firm data, identification of determinants
Design weaknesses	Repeated measures due to sequential timing, artificial scenario	Potential interaction between treatments, activity level of individuals not controlled for, individuals cannot be identified	Missing edges between noncustomers (HB could not be tested), causality cannot be tested
Specific finding	HD and HB are comparable and outperform random by +39%–52% and LD by factor 7–8	HD and HB are comparable and outperform random by +60% and LD by factor 3	HD outperforms random by factor 2 and LD by factor 8–9

cess These tokens were to be shared by initial recipients with friends, who in turn were to spread them further All receivers were asked to enter the tokens on a website that we created for this purpose, along with details about from whom they received these tokens (called the "referrer") Because each participant was provided with unique login information for this website, we could observe the number of tokens entered on the website (and thus the number of successful referrals SR_i) by each individual i for each of the seeding strategies Furthermore, we could distinguish whether the recipient received the tokens directly from the experimenter ("Seeded by Experimenter") or through viral spreading from friends We prohibited and did not observe the use of forums or mailing lists to spread the tokens

The experiment used a 4 × 2 × 2 full-factorial design Following the strategies we defined previously, we seeded the tokens every few days to hubs (high-degree seeding), fringes (low-degree seeding), bridges (high-betweenness seeding), or a random set of participants We varied the number of initial seeds, such that the tokens were sent to either 12 (10%) or 24 (20%) of the 120 participants We also varied the payment levels for successful referrals to account for the potential effects of extrinsic motivation (incentive for sharing yes/no) When they received no incentive for sharing, participants earned remuneration only if they correctly entered the secret token (~ 40 EUR per token, for detailed instructions, see the Web Appendix at http //www marketingpower com/jmnov11) In contrast, under the incentives-for-sharing condition, they received an additional monetary reward when they were named as a referrer (25 EUR per correctly entered token and 20 EUR per referral, for detailed instructions, see the Web Appendix)

Therefore, we systematically varied the 4 × 2 × 2 = 16 different treatments, with two replications per treatment The limitations of the social networking platform's messaging system prevented us from replicating four specific treatments, so we obtained a total of 28 experimental settings (the potential maximum was 4 × 2 × 2 × 2 = 32 experimental settings) Although we systematically varied the treatments, we placed the low-incentive-for-sharing before the high-incentive-for-sharing settings to avoid confusing participants with different incentive instructions We always seeded one token and then captured all responses two weeks after the seeding

Overall, 55% of the participants actively spread or entered unique tokens, resulting in 1155 responses The average number of tokens spread per experimental setting was 41 25, with a standard deviation of 19 21 To compare the success of the strategies, we use a random-effects logistic regression analysis that accounts for individual behavioral differences according to each participant's responsiveness in each experimental setting We use the number of correctly entered tokens as a dependent variable, which can be 1 if the token was correctly reported and 0 if otherwise With 120 participants and 28 experimental settings, we obtained 3360 observations As the independent variables, we included dummy-coded treatment variables that reflect our full-factorial design, as we detail in Table 3

The model achieves a pseudo R-square of 15 5% The proportion of unexplained variance accounted for by subject-specific differences due to unobserved influences, labeled ρ, is greater than 90% Compared with random seeding, the high-degree seeding strategy yields a much higher likelihood of response (odds ratio = 1 53) that is similar to the high-betweenness seeding strategy (odds ratio = 1 39) In contrast, the low-degree seeding strategy dramatically decreases the likelihood of response (odds ratio = 19)

Our treatment variable, high seeding (dummy coded as 0 = 12 seeds and 1 = 24 seeds), positively influences response likelihood Furthermore, the type of incentive offered drives the high odds ratio estimate, which might explain why extrinsic motivation in the form of monetary incentives is popular for viral marketing (e g , recruit-a-friend campaigns offering rewards such as price discounts or coupons for successful referrers, Biyalogorsky, Gerstner, and Libai 2001) Finally, the participants who received the token from the experimenter ("seeded by experimenter") exhibited a higher response likelihood, which is not surprising because the information probability in this case equals 1

TABLE 3
Individual Probability to Respond (i.e., Entering the Correct Token at Experimental Website [Random Effects Logit Model, Study 1])

Variable	Odds Ratio	SE
Seeding Strategy		
Low degree	19***	04
High betweenness	1 39*	28
High degree	1 53**	31
High seeding	1 89***	28
High incentives	38 11***	26 07
Seeded by experimenter	14 36***	3 74
Random coefficient: User ID		
$\ln(\delta_u^2)$	3 36	17
δ_u	5 36	46
P	90	02
R^2 (pseudo)	16	
N	3360	

*p< 1
**p< 05
***p< 01
Notes Two-tailed significance levels n s = not significant Reference category "random" seeding strategy, "low seeding," "no incentives," and "was not seeded by experimenter"

To compare the various seeding strategies directly, we also varied the contrast specifications but left the rest of the model unchanged, which produced the conditional odds ratio matrix in Table 4 As Table 4 indicates, both high-degree and high-betweenness seeding increase response likelihood, in contrast with the random seeding strategy, by 39%–53% Compared with the low-degree seeding strategy (second column of Table 4), all other strategies are five to eight times more successful However, a comparison of the two most successful seeding strategies, high betweenness and high degree, does not yield significant differences This result has key implications for marketing practice, in that degree centrality as a local measure is much easier to compute than betweenness centrality, which requires information about the structure of the entire network

In summary, we find that the low-degree seeding strategy is inferior to the other three seeding strategies and that both high-betweenness and high-degree seeding outperform the random seeding strategy but yield comparable results However, we also acknowledge that this experiment might suffer from sequential effects, which would limit the validity of our separate analysis of each experimental setting The behavior of a respondent in one experimental setting might be influenced by his or her experience in prior experimental settings This problem is driven by the limited number of participants in our experiment Therefore, in Study 2 we include more participants and avoid sequential effects by implementing the four seeding strategies simultaneously

Study 2 Comparison of seeding strategies in a field setting In a second field experiment, we focused on the entire online social network of all students enrolled in the MBA program at the same university as in Study 1 Thus, the network boundary is defined by participation in the program We collected contact information for 1380 students (1380 nodes, 4052 edges) by crawling the same social networking platform to collect information on friendships, and we then calculated the sociometric measures as in Study 1

TABLE 4
Conditional Odds Ratios of Seeding Strategies (Study 1)

	Low Degree	Random	High Betweenness	High Degree
Low degree	—	19***	13***	12***
Random	5 37***	—	72*	65**
High betweenness	7 47***	1 39*	—	91$^{\text{n s}}$
High degree	8 19***	1 53**	1 10$^{\text{n s}}$	—

*p< 1
**p< 05
***p< 01
Notes Two-tailed significance levels n s = not significant Read the second column as follows The odds that a person reacts to the strategy of random seeding is 5 37 times as large as that for low-degree seeding, 7 47 times as large in the strategy of high-betweenness seeding as for low-degree seeding, and 8 19 times as large in the strategy of high-degree seeding as for low-degree seeding The conditional odds ratio of the two seeding strategies relate inversely For example, the odds ratios of random and low degree relate as follows 19 = 1/5 37

The mean degree centrality (standard deviation) is 5.872 (7.318). Study 2 also reveals a high and significant correlation between degree centrality in the bounded network (1380 MBA students at the university) and degree centrality in the entire network of the social networking platform (6.2 million unique users in November 2009). The Pearson correlation of .824 ($p < .001$) thus suggests that the number of friends reported is also a good indicator of degree centrality in abounded network.

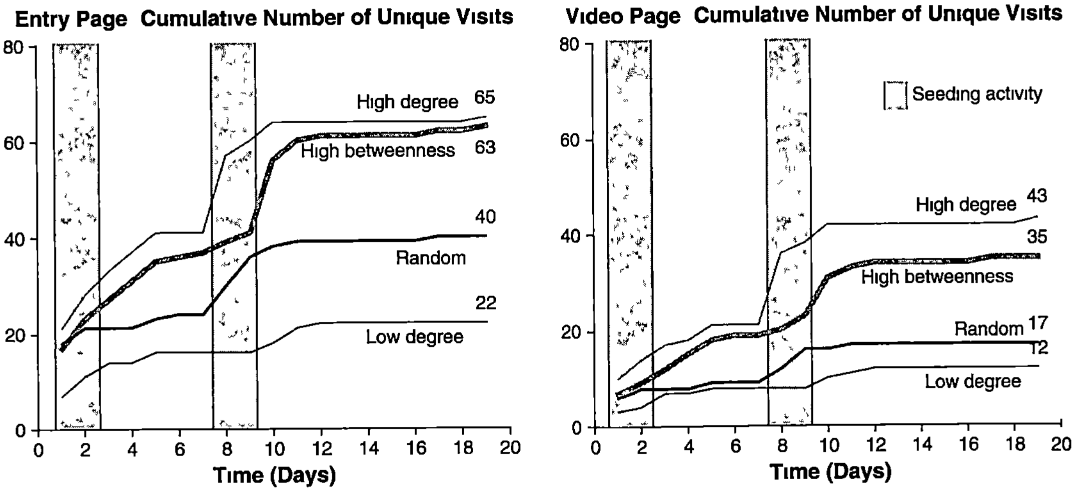
As a proxy for the level of activity, we also used the time since the last profile update in Study 2. We acquired information about 849 update time stamps (we could not access 531 due to the privacy restrictions set by users). On average, users updated their profile 25.7 weeks ago (Mdn = 15.0), and we observed a weak but significant correlation between degree centrality and time (in weeks) since the last profile update ($r = -.192$, $p < .01$). We also observed a correlation between betweenness centrality and time since the last profile update ($r = -.154$, $p < .01$). These negative correlation simply that participants who updated their profiles more recently (and probably update them more frequently) are also more central in the social network. In other words, activity correlates with centrality and may be an additional determinant of the viral spread of information in this setting. In terms of gender (805 male, 569 female, and 6 missing observations), male participants were more central, such that the average female participant had .92 fewer connections than the average male ($p < .05$). However, this gender difference becomes insignificant if we control for activity.

The experimental setup for Study 2 was somewhat different. First, the four treatment groups (hubs, bridges, fringes, or random sample) were all seeded on the same day. Second, we eliminated the incentive variation, such that we did not use extrinsic monetary incentives to stimulate participation. Third, we did not vary the seeding size and sent a reminder out to the initial seeds seven days after the initial seeding. The seeding included 95 participants in each of the four treatments (70 on Day 1, 25 on Day 2), or 7% of the total network (which is in line with Jain, Mahajan, and Muller 1995). The seed message contained a unique URL for a website with a funny video that we produced about the participants' university (the landing page and video were identical for all treatments). By producing a new video specifically for this second field experiment, we ensured that the viral marketing stimulus (i.e., content) was unknown to all participants. Furthermore, we predicted that the link to the video would be distributed preferentially to fellow students (from which we obtained mutual online social network relationships), rather than to others outside the university's social network. In other words, the social network for Study 2 should represent a coherent, self-contained social community. One MBA student served as the initiator who seeded the message to others, according to the chosen seeding strategy. In addition to the link to the particular entry page, the message indicated that the addressees could find a funny video about the university that had just been created by the initiator.

We tracked website visits for the entry pages and video download pages of the four sites (one for each strategy) for 19 days. Figure 1 compares the success of the seeding strategies. The rank order with respect to their success, across both dependent variables, is consistent with the results from our first experiment. That is, high-degree and high-betweenness seeding clearly outperform both low-degree and random seeding. For example, in terms of videos watched, the high-degree seeding strategy yielded more than twice the number of responses than did random seeding. Information about social position thus made it possible to more than double the number of responses.

We also estimated two random-effects linear models (one for the entry page, one for the video page) in which we treated each of the 19 days as a unit of observation, for which we have four observations. The dependent variable is thus the number of unique visits for the entry page and the number of unique video requests from the video page. We included the seeding and reseeding (reminder) days as dummy variables and added another dummy variable to account for weekends. The seeding strategies also are coded as dummy variables, and the experimental day is a unit specific random coefficient. Table 5 illustrates the results.

FIGURE 1
Development of the Number of Unique Visits Over Time (Study 2)


Entry Page Cumulative Number of Unique Visits

Video Page Cumulative Number of Unique Visits

TABLE 5
Number of Visits per Day (Random Effects Model, Study 2)

	Entry Page Unique Visits		Video Page Unique Visits	
Variable	**Coefficient**	**SE**	**Coefficient**	**SE**
High-degree seeding	2 263***	766	1 623***	547
High-betweenness seeding	2 158***	766	1 211**	547
Random seeding	947$^{n s}$	766	263$^{n s}$	547
Seeding day or reseeding	7 128***	1 276	4 005***	727
Weekend	–1 026$^{n s}$	1 569	– 636$^{n s}$	794
Intercept	– 127$^{n s}$	911	– 078$^{n s}$	524
Random Coefficient: Experimental Day				
δ_e	2 375		1 642	
P	519		290	
R^2 (overall)	475		436	

*$p < 1$
**$p < 05$
***$p < 01$
Notes Two-tailed significance levels n s = not significant Reference categories "low-degree seeding" and "weekdays" and "no seeding day"

The models for both the entry and video pages are highly significant, with explained overall variances (adjusted R^2) of 47 5% and 43 6% The results in Figure 1 confirm our previous observations High-degree and high-betweenness seeding yield comparable results and are three times more successful than low-degree seeding and 60% more successful than random seeding Days with seeding or reseeding activities yield more unique visits Responsiveness declined on weekends (albeit insignificantly), perhaps due to the overall higher level of online activity by these students on weekdays

In summary, Study 2 supports our findings from Study 1 that seeding to hubs and bridges is preferable to seeding to fringes However, we also note the potential for interactions among the activities associated with the four seeding strategies in Study 2 For example, a participant might have watched the video after receiving a message from seeding strategy A and then receive a nearly identical message from seeding strategy B, in which case this participant is unlikely to click the link again to watch the same video Thus, seeding strategies that foster faster diffusion may have an advantage that could bias the result and lead to over estimations of the success of high-degree and high-betweenness seeding in contrast with random and low-degree seeding However, in Study 1, such crossings were not possible as a result of the sequential timing, and the results remained the same Neither Study 1 nor Study 2 identifies the reasons for the superiority of specific seeding strategies In addition, we cannot distinguish between first- and second-generation referrals We address these shortcomings in Study 3

Comparison of the Effect of Seeding Strategies on the Determinants of Social Contagion in a Real-Life Viral Marketing Campaign (Study 3)

For Study 3, a mobile phone service provider stimulated referrals (through text messages) to attract new customers The provider tracked all referrals, so we can compare the economic success of different seeding strategies and analyze the influence of the corresponding sociometric measures on all determinants of social contagion (Table 1) in a real-life setting This helps us identify the reasons for any differences Thus, Study 3 enables us to decompose the effect of the different determinants that drive the social contagion process, including participation probability P_i, the used reach n_i, the mean conversion rate w_i of all referrals made by ion the expected number of referrals R_i, and the expected number of successful referrals SR_i The viral marketing campaign of the mobile phone service provider featured text messages sent to the entire customer base ($n = 208{,}829$ customers), promising a 50% higher reward than the regular bonus of € 10 worth of airtime for each new customer referred in the next month In total, 4549 customers participated in the campaign, initiating 6392 first-generation referrals, which was a 50% increase over the average number of referrals We anticipate that social contagion works through belief updating, as prospective customers talk to adopters about the product Furthermore, in Becker's (1970) terms, we classify this product as a low-risk offering (cf trials of untested drugs)

Our analysis of the social contagion process is based on a rich data set, each referral activity was logged in the online referral system of the company, because customers had to initiate the referral messages to friends online Successful referrals were confirmed during the registration process of the new customers, who had to identify their referrer to trigger the payment of the referral premium Thus, we gathered information about whether customers acted on the stimulus of the referral, captured by the variable program participation P_i, as well as the number of referrals R_i and the number of successful referrals SR_i The mean conversion rate per referrer w_i can be inferred from a comparison of R_i and SR_i We used individual-level communication data and the number of text messages to others to calculate the (external) degree centrality (In total, we evaluated more than 100 million connections [1]) We assumed that any telephone call or text message between people (independent of the direction) reflected social ties Thus, degree centrality equals a count of the total number of unique communication relationships However, the service can only be referred to current non customers, so the degree centrality metric accounts only for ties that customers had to people outside the service network at the beginning of the viral marketing campaign, which makes it a form of external degree centrality We lacked information about the relationships of people who were not customers, so we could not measure betweenness centrality and test the high-betweenness seeding strategy in Study 3

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[1] All individual-level data were made anonymous with a multistage encryption process, undertaken by the firm before the analysis At no point was any sensitive customer information, such as names or telephone numbers, disclosed

We used the following customer characteristics as covariates demographic information including age (in years) and gender (1 = female, and 0 = male), service-specific characteristics, such as customer tenure (i e , length of the relationship with the company in months), and the tariff plan We operationalized the tariff plan with a dichotomous variable to indicate whether the customer chose a community tariff (=1, including a reduced per-minute price for calls within the network) or a one-price tariff (=0) Furthermore, we used two measures of customers' trust in the service payment type (dichotomous variable automatic = 1, and manual = 0) and refill policy (dichotomous variable automatic = 1, and manual = 0) In the case of automatic payment and refill, customers provided credit card details to the service provider Finally, we included information about the acquisition channel for each customer (1 = offline/retail, and 0 = online) As additional controls, we include information on the individual service usage of the customer, namely, average monthly airtime (in minutes) and monthly short message service (SMS)—that is, the average monthly number of SMS sent by a customer

Our model reflects the two-stage process for each participant, who first decides whether to participate (P_i) and then chooses to what extent to participate (n_i) A specific characteristic of the first stage is the relatively large share of zeros (i e , nonparticipants), whereas observed values for the second stage are count measures and highly skewed This data structure requires specific two-stage regression models either inflation models, such as the zero-inflated Poisson (ZIP) regression (Lambert 1992), or hurdle models, such as the Poisson-logit hurdle regression (PLHR) model (Mullahy 1986) We use a PLHR model, which combines a logit model to account for the participation decision and a zero-truncated Poisson regression to analyze the actual outcomes of participation (e g , number of successful referrals) [2] In our PLHR specification, the binary variable P_i indicates whether individual i participates in the referral program (hurdle or logit model) In addition, Used Reach n_i indicates how many referrals the individual i initiates, conditional on the decision to participate ($P_i = 1$) As an extension, Converted Reach $CR = (n_i \times w_i)$ indicates how many successful referrals individual i initiates, again conditional on the decision to participate Note that Used Reach n_i and Converted Reach CR_i are equivalent to Referrals R_i and Successful Referrals SR_i, respectively, conditional on a program participation probability $P_i = 1$ These variables provide the dependent variables in the Poisson regression of our PLHR specification

Let P_i^* be the latent variable related to P_i, n_i^* be the censored variable related to n_i, and $CR^* = (n_i^* \times w_i)^*$ be the censored variable related to $CR = (n_i^* \times w_i)$ Together with the explanatory variable of (external) degree centrality and the covariates (age, gender, payment type, refill policy, acquisition channel, and customer tenure), the PLHR can be specified as follows

$$(3)\quad P_i = \begin{cases} 1 & \text{if } P_i^* > 0 \\ 0 & \text{otherwise,} \end{cases} \qquad \text{where } P_i^* = \beta_{P0i} + \beta_{Pij} \times X_{Pij} + \varepsilon_{Pi},$$

$$(4)\quad n_i = \begin{cases} n_i^* & \text{if } P_i^* > 0 \\ 0 & \text{otherwise,} \end{cases} \qquad \text{where } n_i^* = \beta_{UR0i} + \beta_{URij} \times X_{URij} + \varepsilon_{URi},$$

and

$$(5)\quad CR = (n_i \times w_i) = \begin{cases} (n_i \times w_i)^* & \text{if } CR_i^* > 0 \\ 0 & \text{otherwise,} \end{cases}$$

$$\text{where } (n_i \times w_i)^* = \beta_{CR0i} + \beta_{CRij} \times X_{CRij} + \varepsilon_{CRi}$$

Thus, X_{ij} contains the explanatory variables j (i e , degree centrality and the covariates) and the error terms ε_{Pi}, ε_{URi}, and ε_{CRi}, which represent unobserved influences on participation probability, used reach, and the number of successful referrals

Seeding strategies in first-generation models In a first step, we restricted our analysis to first-generation models, we only considered referrals directly initiated by customers who received the seeding stimulus during the viral marketing campaign Table 6 contains the parameter estimates of the PHLR model The results can be interpreted in two stages first, what drives the participation of seeded customers in the viral marketing campaign (logit component = LC) and, second, among these participants, what influences the number of referrals and successful referrals (Poisson component = PC) With regard to the covariates' impact on program participation, we find significant effects of the demographic variables gender ($\beta^{LC}_{2n*} = - 2171$, $p < 01$) and age ($\beta^{LC}_{3n*} = - 0209$, $p < 01$), indicating that male and older customers are more likely to participate, as are customers with short customer tenures who have just recently adopted the service ($\beta^{LC}_{8n*} = - 0016$, $p < 01$) The latter finding aligns with cognitive dissonance theory, in that these customers might communicate shortly after their purchase decision to reduce dissonance (Festinger 1957) Furthermore, we found that customers acquired online are more strongly engaged in the (online-based) referral program than customers acquired through the retail channel ($\beta^{LC}_{6n*} = - 9843$, $p < 01$) A one-price tariff seems easier to communicate, seeded customers with that tariff option are more likely to participate in the referral program ($\beta^{LC}_{7n*} = - 1433, p < 01$) With regard to the usage covariates, we find positive and significant values for monthly airtime ($\beta^{LC}_{9n*} = 0007, p < 01$) and monthly SMS ($\beta^{LC}_{10n*} = 0010, p < 01$) The influences of most covariates are comparable between the logit and Poisson regression stages, except the acquisition channel, in that retail customers are less likely to participate in the program, but if they do, they exhibit significantly greater activity than online customers ($\beta^{PC}_{6n*} = 7388, p < 01$) The same applies to the usage covariates Here, monthly airtime ($\beta^{PC}_{9n*} = - 0007, p < 1$) and monthly SMS ($\beta^{PC}_{10n*} = - 0018, p < 01$) show negative effects on participation

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[2] We choose PLHR over ZIP because the logit stage of the former is designed to determine what leads to participation (i e , identifying referrers, in which we are interested), whereas the inflation stage of ZIP tries to detect "sure zeros" (i e , nonparticipants)

However, the influence of (external) degree centrality varies between the stages of the model In the logit regression stage, degree centrality has a positive and significant influence on the likelihood to participate P_i in the referral program ($\beta^{LC}_{1n*} = 0032, p < 01$) Confirming the results of Studies 1 and 2, this finding shows that customers with high degree centrality are more likely to participate than those with low degree centrality (average degree centrality of participants = 45 3 vs nonparticipants = 36 5) However, in the Poisson regression stage that analyzes only the group of active referrers, the effect of degree centrality is mixed We find a significant, positive effect on used reach ($\beta^{PC}_{1n*} = 0012, p < 01$), such that customers with high-degree centrality are not only more likely to participate but also more active when participating in the viral marketing campaign However, we find no significant effect of degree centrality on the referral success of active referrers ($\beta^{PC}_{1CR} = - 0002$, n s)

This result is further confirmed when we analyze the mean conversion rate of referrals per referrer $w_i = CR_i/n_i^*$ (see Table 7) Again, we do not find a significant effect of degree centrality for active referrers ($\beta_{1w} = 0001$, n s) Thus, our results offer no support for the assumption that participating central customers are more persuasive referrers or better selectors of potential referral targets

Next, considering that viral marketing campaigns can be costly, we attempt to identify customers who are most likely to participate and generate (successful) referrals We use the estimated participation probability calculated from the results of the selection model (see Table 6, "Logit Component") to group the full customer base into cohorts and then compare these cohorts according to their observed participation, referral, and conversion rates and degree centrality (see Table 8) The top 5000 cohort corresponds to a high-degree and the bottom 5000 cohort to a low-degree seeding strategy, the results in the "Average" column correspond to random seeding

TABLE 6
Determinants of Number of Referrals, Number of Successful Referrals, and Influence Domain (Poisson-Logit Hurdle Regression Models, Study 3)

		Used Reach n*		Converted Reach CR = (n*w)*		Conditional Influence Domain ID_i^T	
Variable		Coefficient	SE	Coefficient	SE	Coefficient	SE
Logit Component							
Degree centrality	β_1	0022***	0003	0021***	0004	0021***	0004
Covariates							
Gender	β_2	- 2287***	0318	- 2527***	0337	- 2527***	0337
Age	β_3	- 0202***	0013	- 0190***	0014	- 0189***	0014
Payment type	β_4	0913**	0389	0668^{n s}	0412	0668^{n s}	0412
Refill policy	β_5	- 0122^{n s}	0376	0174^{n s}	0396	0174^{n s}	0396
Acquisition channel	β_6	- 9848***	0506	-1 0535***	0545	-1 0530***	0545
Tariff plan	β_7	- 1371***	0395	- 1253***	0419	- 1253***	0420
Customer tenure	β_8	- 0016***	0001	- 0016***	0001	- 0016***	0001
Monthly airtime	β_9	0007***	0002	0007***	0002	0007***	0002
Monthly SMS	β_{10}	0010***	0002	0009***	0002	0010***	0002
Intercept		-2 3825***	0727	-2 534***	0770	-2 5341***	0770
Poisson Component							
Degree centrality	β_1	0026***	0006	0001^{n s}	0033	- 0025***	0007
Covariates							
Gender	β_2	- 1539***	0519	- 1177^{n s}	2206	- 3323***	0496
Age	β_3	- 0098***	0020	- 0104^{n s}	0087	- 0112***	0019
Payment type	β_4	- 3908***	0581	- 1807^{n s}	2492	- 1379**	0544
Refill policy	β_5	- 3417***	0761	- 1369^{n s}	2819	0033^{n s}	0608
Acquisition channel	β_6	7408***	0561	5902**	2592	6273***	0548
Tariff plan	β_7	-1 0740***	0473	-1 1426***	2067	- 5322***	0466
Customer tenure	β_8	- 0007***	0002	- 0007^{n s}	0007	- 0013***	0001
Monthly airtime	β_9	- 0007*	0004	- 0000^{n s}	0000	0000^{n s}	0003
Monthly SMS	β_{10}	- 0018***	0005	- 0001^{n s}	0019	0005^{n s}	0004
Intercept		9811***	0941	-1 4633***	4181	1 1008***	0905
Log-likelihood value		-25,163		-19,850		-23,723	
BIC		50,596		39,969		47,714	
N				208,829			

*$p < 1$
**$p < 05$
***$p < 01$
Notes Two-tailed significance levels n s = not significant

TABLE 7
Determinants of Conversion Rates, Active Referrers (Poisson Regression, Study 3)

		Poisson Regression Model Conversion w = CR/n*	
Variable		**Coefficient**	**SE**
Degree centrality	β_1	− 0001$^{n s}$	0004
Covariates			
Gender	β_2	0788**	0350
Age	β_3	0047***	0015
Payment type	β_4	1104***	0431
Refill policy	β_5	1079***	0409
Acquisition channel	β_6	− 4951***	0616
Tariff plan	β_7	4638***	0472
Customer tenure	β_8	0002*	0001
Intercept		−1 2014***	0848
Log-likelihood value		−5, 074	
N		4,549	

*$p < 1$
**$p < 05$
***$p < 01$
Note Two-tailed significance levels n s = not significant For the Poisson regression model, we used ln(n) as offset variable

The results in Table 8 clearly confirm the positive correlation between degree centrality and the success of viral marketing As the estimated participation probability increases, observed participation, referral, and conversion rates (i e , total number of participants, referrals, or successful referrals divided by number of seeded customers in the cohort) and degree centrality increase as well Thus, the participation rate of the top 5000 cohort is a multiple of that of the bottom 5000 cohort (4 4% vs 5%), with a much higher average degree centrality (70 8 vs 18 0) A high-degree seeding strategy would be nearly nine times as successful as a low-degree strategy Compared with the average value of a random strategy, the top 5000 cohort participation and degree centrality are twice as high, therefore, targeting hubs doubles the performance of random seeding for a sample of the same size Thus, Study 3 clearly shows the significant, positive effect of degree centrality on viral marketing participation and activity, in strong support of a high-degree seeding strategy However, the results of the Poisson regression model do not indicate higher referral success of hubs within the group of active referrers

Seeding strategies in multiple-generation models In the second step of our empirical analysis, we extended the measure of success to account for a fuller range of the effects of seeding efforts by including more than one generation of referrals First-generation referrals initiate a viral process that should continue in further generations The extent of this viral branching may differ across seeding strategies, due to their ability to reach different parts of the social network Thus, the optimal seeding strategy might change if we consider multiple generations

To capture this form of success, we measured all subsequent referrals that originated from a first-generation referral during the campaign We limited the observation period to 12 months because the company repeated the referral campaign 13 months after the initial seeding During our observation period, the company did not engage in other promotions that directly focused on referrals, nor did we find any anomalies (e g , drastic increases or decreases) in company-owned or competitive marketing spending

In the first year after the campaign, 20 8% of all first-generation referrals became active referrers themselves, and 5 8% did so multiple times We observed viral referral chains with a maximum length of 29 generations, on average, every first-generation referral during the campaign led to 48 additional referrals

The dependent variable for this analysis is the influence domain of all successful referrals of a specific first-generation customer, which equals the number of successful first-generation referrals, plus the number of successful referrals in successive generations during the subsequent 12 months[3] For example, Figure 2 depicts the influence domain of a referral customer X that spans 22 additional successful referrals over seven generations

TABLE 8
Relationship of Conversion Rates and Degree Centrality, Full Sample (Study 3)

	Customer Cohort (According to Estimated Participation Probabilities)					
	Top 5000	**Top 10,000**	**Top 20,000**	**Top 50,000**	**Bottom 5000**	**Average**
Participants						
Total participation	220	378	671	1385	24	—
Participation rate	4 4%	3 8%	3 4%	2 8%	5%	2 2%
Referrals						
Total referrals	292	489	856	1783	26	—
Referral rate	5 8%	4 9%	4 3%	3 6%	5%	3 0%
Successful referrals						
Total conversions	191	330	598	1233	19	—
Conversion rate	3 8%	3 3%	3 0%	2 5%	4%	2 0%
Average degree centrality	70 83	60 21	52 13	45 42	18 01	36 48

Notes Top (Bottom) 5,000/10,000/ refer to the cohort of customers with the highest (lowest) estimated participation probabilities, according to the coefficient estimates of the logit component reported in Table 6 We calculated rates by dividing the total number of participants, referrals, or successful referrals by the total number of customers in the cohort

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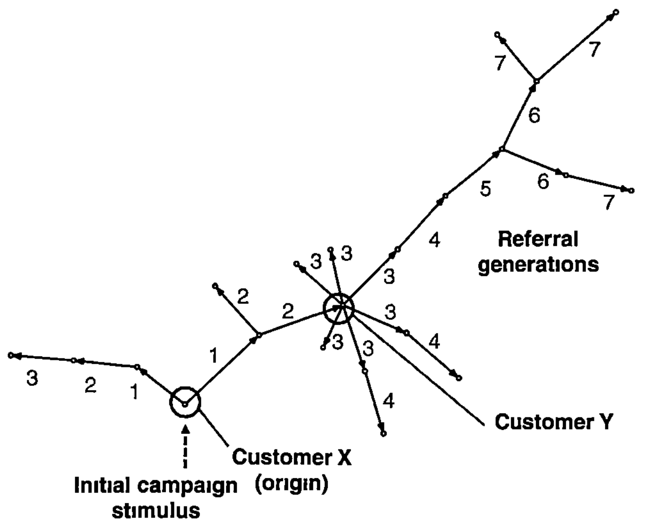
[3] Note that, by definition, there is no overlap of influence domains between two origins, every referred customer has an in-degree of 1, and only one specific referrer is rewarded for every new customer

FIGURE 2
Influence Domain of a Referral Campaign Participant (Study 3)



The parameter estimates of the PLHR model for this multiple-generation model appear in the right-hand column of Table 6 The dependent variable ID_i^T is conditional on program participation ($P_i = 1$) When we compare the regression model parameters across the different dependent variables, we find similar results for Influence Domain ID_i^T and Used Reach n_i (e g , no significant effect of the usage covariates) but with one important difference Our focal variable, degree centrality, is negative ($\beta^{PC}_{\mathrm{IID}} = -00205$, $p < 01$) in the Poisson regression model That is, among the participants, more central customers have a smaller influence domain The observed network structure of the referral processes offers a potential explanation of this surprising result For hubs, we mostly observe short referral chains (if at all), whereas fringe customers who participate in the viral marketing campaign demonstrate significantly longer referral chains For example, in Figure 2, the fringe customer X reacts to the campaign and refers the service Within two generations, this referral reaches actor Y, who initiates a total of 15 additional referrals, which increases the influence domain of X to 22

Because we find a positive effect of high degree centrality in the selection model but a negative effect in the regression model, the overall effect of degree centrality remains unclear For a simple test, we performed both an ordinary least squares (OLS) and a simple Poisson regression, with the unconditional Influence Domain ID_i^R as the dependent variable for the complete sample of 208,829 customers who received the viral marketing campaign stimulus According to the results in Table 9, the standardized beta for degree centrality is positive and significant in both regressions ($\beta^{OLS}_{\mathrm{IID}} = 010$, $\beta^{PR}_{\mathrm{IID}} = 002$, $p < 001$), such that the overall effect of high degree centrality as a selection criterion for seeding a viral marketing campaign is positive Therefore, high-degree seeding remains the more successful strategy, even if we account for a multiple-generation viral process

Robustness checks To check the robustness of our findings, we also analyzed our data with a set of alternative approaches, including a Poisson-based (ZIP regression) and probit–OLS combinations (e g , Tobit Type II models) Our core results pertaining to the influence of degree centrality, including its positive influence on the selection stage to determine the likelihood of participation and its negative effect on the influence domain in the regression stage, hold across all tested models The results also remain unchanged when we incorporate alternative individual-level covariates, such as monthly mobile charges, that represent the attractiveness of a customer to the provider

Unlike Studies 1 and 2, Study 3 does not allow us to assess the causal effect of the seeding strategy on referral

TABLE 9
Determinants of Unconditional Influence Domain (OLS Model, Study 3)

		OLS Model Unconditional Influence Domain (ID_i^R)		Poisson Regression Model Unconditional Influence Domain (ID_i^R)	
Variable		**Standard Coefficient**	**SE**	**Coefficient**	**SE**
Degree centrality	β_1	010***	000	002***	000
Covariates					
Gender	β_2	– 015***	002	– 358***	028
Age	β_3	– 024***	000	– 024***	001
Payment type	β_4	001^n s^	002	013^n s^	033
Refill policy	β_5	000^n s^	002	003^n s^	033
Acquisition channel	β_6	– 025***	002	– 680***	039
Tariff plan	β_7	– 016***	002	– 433***	030
Customer tenure	β_8	– 031***	004	– 002***	000
Intercept		091***	004	–1 509***	058
R^2 (pseudo)		05		03	
N		208,829		208,829	

*$p < 1$
**$p < 05$
***$p < 01$
Notes Two-tailed significance levels n s = not significant

success unambiguously. However, it reflects a real-life marketing application and is based on detailed firm data, such that it strikingly illustrates the power of network information in real-life situations.

General Discussion

Research Contribution

Inspired by conflicting recommendations in previous studies regarding optimal seeding strategies for viral marketing campaigns, this article empirically compares the performance of various proposed strategies, examines the magnitude of differences, and identifies determinants that are responsible for the superiority of a particular seeding strategy. To the best of our knowledge, such an experimental comparison of seeding strategies is unprecedented; previous literature is based solely on mathematical models and computer simulations. Our real-life application provides some answers to controversies about whether hubs are harder to convince, whether they make use of their reach, and whether they are more persuasive.

Marketers can achieve the highest number of referrals, across various settings, if they seed the message to hubs (high-degree seeding) or bridges (high-betweenness seeding). These two strategies yield comparable results and both outperform the random strategy (+52%) and are up to eight times more successful than seeding to fringes (low-degree seeding). The superiority of the high-degree seeding strategy does not rest on a higher conversion rate due to a higher persuasiveness of hubs but rather on the increased activity of hubs, which is in line with previous findings (e.g., Iyengar, Van den Bulte, and Valente 2011; Scott 2000). This finding is persistent even when we control for revenue of customers and thus demonstrates the importance of social structure beyond customer revenues and customer loyalty.

Research that suggests a low-degree seeding strategy is usually based on the central assumption that highly connected people are more difficult to influence than less connected people because highly connected people are subject to the influence of too many others (e.g., Watts and Dodds 2007). Our results (Studies 1 and 3) reject this assumption and underline Becker's (1970) suggestion: Hubs are more likely to engage because viral marketing works mostly through awareness caused by information transfer from previous adopters and through belief updating, especially for low-risk products. The low perceived risk means hubs do not hesitate before participating. Furthermore, when social contagion occurs mostly at the awareness stage, the possible disproportionate persuasiveness of hubs is irrelevant. As long as the social contagion occurs at the awareness stage through simple information transfer, hubs are not more persuasive than other nodes (Godes and Mayzlin 2009; Iyengar, Van den Bulte, and Valente 2011).

Our analysis of a mobile service provider's viral marketing campaign reveals that hubs make slightly more use of their reach potential. Furthermore, for the group of participating customers, we find a negative influence of greater connectivity on the resulting influence domains. Although in epidemiology studies infectious diseases spread through hubs, we find that well-connected people do not use their greater reach potential fully in a marketing setting. Spreading information is costly in terms of both time invested and the effort needed to capture peers' attention. Furthermore, hubs may be less likely to reach other previously unaffected central actors, such that they are limited in their overall influence domain. The compelling findings from sociology and epidemiology thus appear to have been incorrectly transferred to targeting strategies in viral marketing settings.

Nevertheless, the social network remains a crucial determinant of optimal seeding strategies in practice because a social structure is much easier to observe and measure than communication intensity, quality, or frequency. Furthermore, we find robust results even when we control for the level of communication activity. Therefore, companies should use social network information about mutual relationships to determine their viral marketing strategy.

Managerial Implications

Viral marketing is not necessarily an art rather than a science; marketers can improve their campaigns by using sociometric data to seed their viral marketing campaigns. Our multiple studies show that information about the social structure is valuable, in that seeding the "right" consumers yields up to eight times more referrals than seeding the "wrong" ones. In contrast with random seeding, seeding hubs and bridges can easily increase the number of successful referrals by more than half. Thus, it is essential for marketers to adopt an appropriate seeding strategy and use sociometric data to increase their profits. We conclude that adding metrics related to social positions to customer relationship management databases is likely to improve targeting models substantially.

Many companies already have implicit information about social ties that they could use to calculate explicit sociometric measures. Telecommunication providers can exploit connection data (as we did in Study 3), banks possess data about money transfers, e-mail providers might analyze e-mail exchanges, and companies can evaluate behaviors in company-owned forums. Many companies also have indirect access to information on social networks, such as Microsoft through Skype or Google through its Google mail services, and they could begin to use information obtained this way (e.g., Hill, Provost, and Volinsky 2006; Aral, Muchnik, and Sundararajan 2009). Such network information is further available in the form of friendship data obtained from online social communities such as Facebook or LinkedIn (e.g., Hinz and Spann 2008).

Remarkably, we reveal that to target a particular subnetwork (e.g., students of a particular university, Study 2) with a viral marketing message, the use of the respective subnetwork's sociometric measures is not absolutely required to implement the desired seeding strategies. Instead, because the sociometric measures of subnetworks and their total network are highly correlated, marketers can use the sociometric measures of the total network, without undertaking the complex task of determining exact network boundaries. Conversely, this appealing result also allows marketers to feel confident in inferring the connectivity of a person in an overall network from information about his or her connectivity in a natural subnetwork. Moreover, because betweenness centrality requires knowledge about the structure of the entire network, as well as a complex, time-consuming computation, degree centrality seems to be the best sociometric measure for marketing practice (see also Kiss and Bichler 2008)

According to these insights, marketers should pick highly connected persons as initial seeds if they hope to generate awareness or encourage transactions through their viral marketing campaigns because these hubs promise a wider spread of the viral message As long as the social contagion operates at the awareness stage through information transfer, we do not observe that hubs are more persuasive Thus, the sociometric measure of degree centrality cannot be used to identify persuasive seeding points The use of demographics and product-related characteristics (see Table 7) seems more promising for this purpose Study 1 reveals that monetary incentives for referring strongly increase the spread of viral marketing messages, which supports the use of such incentives However, they would also make viral marketing more costly than is commonly assumed

Finally, expertise in the domain of social networks is valuable for seeding purposes Thus, online communities such as Facebook might begin to offer information on members' social positions to third-party marketers or provide the option to seed to a specific target group according to sociometric measures Specialized service providers might adopt a similar idea to tailor their offerings with respect to optimal seeding Business models might reflect social network information collected from communication relationships or domain expertise in certain subject domains, such that they target the most highly connected or intermediary persons with specific marketing information and thus maximize the success of viral marketing campaigns For example, the Procter & Gamble subsidiaries Vocal point and Tremor already use social network information to introduce new products, enjoying doubled sales in some test locations

Limitations and Directions for Further Research

Although we designed our experiments carefully, some of their shortcomings might limit the validity of the results In Study 1, order effects may exist because the sets of participants in the different experimental settings are not disjunctive We designed Study 2 to avoid such an overlap, but the parallel timing in that experiment could lead to interrelationships across the different seeding strategies However, as we noted previously, seeding strategies that lead to faster diffusion might have performed better, which also reflects reality well In a world in which people become increasingly exposed to multiple viral campaigns competing for their attention and participation, seeding strategies that lead to faster diffusion may be advantageous for the initiator of the particular viral marketing campaign

The student sample and the artificial information content of the experiments constitute additional limitations in our experimental studies, though these shortcomings do not systematically favor one strategy over another It would be useful to conduct similar experiments with different samples and less artificial information, such as real-life viral marketing campaigns

In our real-life application, we could compare only high- and low-degree and random seeding strategies We did not differentiate referrals with regard to the profit of the referred customers (for an analysis of the value of customers acquired through referral programs, see Schmitt, Skiera, and Van den Bulte 2011), but our robustness checks show no significant regression-stage effects of additional covariates on converted reach or influence domain Our results regarding the effects of degree centrality also remain unchanged across the robustness checks

Most current research focuses on individual choices and treats the choices of partners (within the social network) as exogenous, as we do, these studies assume that the network remains fixed for the duration of the study and unaffected by it However, this strong assumption ignores the likely effects of dynamics inherent to real-life social networks (e g , Steglich, Snijders, and Pearson 2010) Marketing response models that incorporate these effects would be a fruitful avenue for further research Another extension might incorporate information on the dyadic level, such as tie strength, which could distinguish the success of referrals from a specific customer In addition, from a marketing perspective, it would be useful to intensify research regarding the effects of incentives, as we find their impact to be quite significant in Study 1 (e g , Schmitt, Skiera, and van den Bulte 2011, Aral, Munchnik, and Sundararajan 2011)

Our combination of two experimental studies and an *ex post* analysis of a real-world viral marketing campaign provides a strong argument that hubs and bridges are key to the diffusion of viral marketing campaigns We cannot confirm recent findings that question the exposed role of hubs for the success of viral marketing campaigns, but our analysis of the different determinants in Study 3 yields additional explanations for why hubs make more attractive seeding points These findings should serve as inputs to create more realistic computer simulations and analytical models

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Sara Valentini, Elisa Montaguti, & Scott A. Neslin

Decision Process Evolution in Customer Channel Choice

The growing number of sales channels through which customers can make purchases has made it imperative for managers to understand how customers decide which channels to use. However, this presents a significant challenge because there is reason to believe the channel decision process evolves over the lifetime of the customer. The authors document the existence and nature of this phenomenon by analyzing the evolution of a customer's channel choice decision process from a trial stage to a posttrial stage. First, they analyze data for a book retailer and replicate their analysis using data from a durables and apparel retailer. Their results suggest that (1) customers' decision processes do evolve, (2) a minority but sizeable segment changes decision processes within the observation period, and (3) customers who change do so from a decision process in which they are highly responsive to marketing to one in which they are less responsive. The authors illustrate and discuss the implications for both managers and researchers.

Keywords: multichannel marketing, channel migration, customer relationship management, customer channel choice

The ever-expanding multiplicity of channels through which customers can purchase makes it imperative for managers to understand how customers decide which channels to use. One potential benefit of this understanding is that managers can then fine-tune channel strategies to enhance customer value through effective multichannel customer management (Neslin et al. 2006). While researchers have made progress in understanding the customer channel decision process (Blattberg, Kim, and Neslin 2008, chap. 25), the managerial press reports that retailers' knowledge of this decision process is still limited and that surprisingly few companies are effective in managing multichannel strategies (Myers, Van Metre, and Pickersgill 2004; Noble, Shenkan, and Shi 2009; Weinberg, Parise, and Guinan 2007).

We propose that one factor contributing to the difficulty in understanding the customer channel decision process is that the process is a moving target—in other words, it evolves over the lifetime of the customer. For example, this would mean that managers need to treat new-to-the-firm customers differently than mature customers in terms of multichannel customer policy. A newly acquired customer may be in a "deliberative" mind-set (Gollwitzer and Bayer 1999) and thus be open to suggestions about which channel to use (i.e., responsive to marketing efforts); in contrast, as the customer learns more about the firm's channels, he or she becomes less receptive to these efforts. This would mean that the window during which to "right-channel" the customer (Neslin and Shankar 2009) may be directly after the customer is acquired.

Therefore, it is critical that managers understand if, and if so how, the customer channel decision process evolves. The purpose of this study is to investigate the existence and nature of this evolution and explore its managerial implications. Our focus is not about *which* channels consumers choose to make their purchases in, but *how* they decide which channels to choose for purchase and how that decision process changes over time. We examine four major questions:

1. Does the customer channel choice decision process change over time? That is, is decision process evolution a real phenomenon?
2. If so, how many customers "learn" a new decision process quickly (learners) versus how many customers evolve more gradually (stayers)?
3. How does the learners' initial, or trial, stage decision process compare with their later or posttrial stage decision process?
4. What are the profit implications for more effective multichannel customer management?

Our findings across two data sets confirm that the customer decision process changes over time. In a data set in which a book club retailer acquires customers and we observe these customers over time, a significant learner segment (22% of customers) becomes less inertial with respect

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to channel choices and more driven by channel preferences At first, their channel decisions are shaped significantly by the firm's marketing efforts, but later they become less responsive to marketing These changes are set in motion soon after a company "acquires" a customer Therefore, companies should try to "right-channel" customers soon after they are acquired Customers who are more likely to learn can be characterized according to directly measurable indicators such how these customers are acquired, their proclivity to provide their e-mail address, and their age We illustrate that by using these characteristics to identify the learner segment and by using e-mail to transition them early into the cheaper Internet channel, the company can increase its profits by approximately 24% In a second data set, provided by a durables/apparel retailer that has just introduced a new purchase channel, we confirm that customers become less responsive to marketing over time, although do not find that the process becomes more preference driven over time

We proceed as follows We develop a framework for the channel decision process and a taxonomy of potential evolution patterns Then, we discuss the theory of why decision processes should evolve and advance hypotheses Next, we describe our methodology for measuring decision process evolution We then show our data, results, and profitability illustration We conclude with a discussion of implications for research and practice

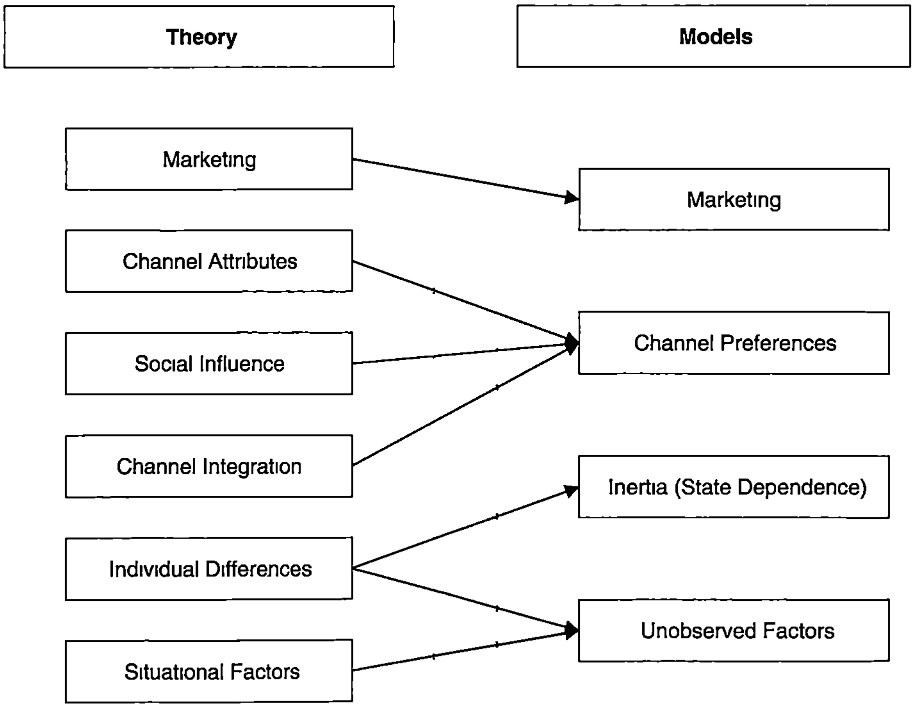
A Taxonomy for Categorizing Decision Process Evolution

Blattberg, Kim, and Neslin (2008) and Neslin et al (2006) summarize six factors that determine customer channel choice (1) marketing, (2) channel attributes, (3) social influence, (4) channel integration, (5) individual differences, and (6) situational factors (see Figure 1) Researchers have organized these factors into marketing, channel preferences, inertia or state dependence, and unobserved factors, as shown in the right side of Figure 1 This suggests that the channel choice decision can be represented as follows

(1) Channel choice = f(marketing, channel preference, state dependence)

The drivers of channel choice in Equation 1 and their relative impact characterize the channel choice decision process Several researchers have estimated models according to Equation 1 (Ansari, Mela, and Neslin 2008, Knox 2006, Thomas and Sullivan 2005, Venkatesan, Kumar, and Ravishanker 2007, Verhoef, Neslin, and Vroomen 2007) Knox shows that channel preference can change over time A common finding is that customers differ in the relative impact the three drivers have on their channel choice process We account for this heterogeneity and also allow the relative impact of the three factors to evolve over time

FIGURE 1
A Framework for the Multichannel Choice Process: Theory Translated into Models



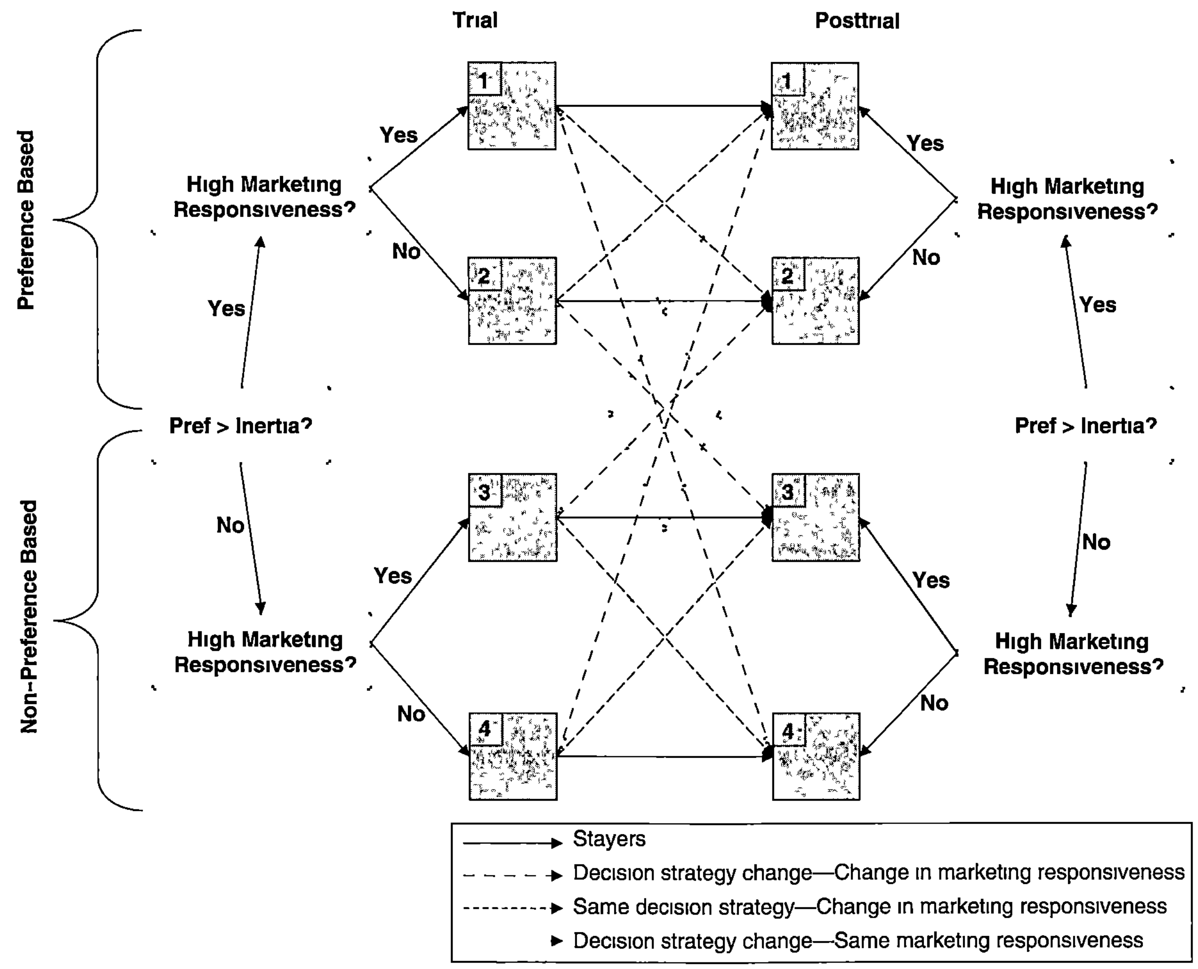
Notes By "theory," we mean the factors that have been identified as influencing customer's channel choices (for a discussion, see Blattberg, Kim, and Neslin 2008, Neslin et al 2006)

Figure 2 shows how the relative impact of preferences, marketing, and inertia define a taxonomy of potential evolution patterns Starting from the left, we ask whether the decision is preference based or non–preference based Next, we ask whether the customer is marketing responsive or not marketing responsive This produces four potential decision processes The arrows show how the customer's process might evolve from a trial to a posttrial stage A customer's trial stage process might be non–preference based but highly responsive to marketing (Category 3), but it might evolve to a posttrial classification of preference based and not marketing responsive (Category 2) There are 12 possible evolution patterns and four cases in which the process does not change

Hypotheses

This first question is, Why should the decision process evolve? Theory often starts with observation, and this is the case with decision process evolution Aaker (1971) finds that preferences for a new product develop over a trial stage, in which the consumer learns about the product, to a posttrial stage, in which the consumer has learned his or her final preference for the product and purchases accordingly This can be viewed as isomorphic to Gollwitzer and Bayer's (1999) theory that consumer decision making moves from a deliberative to an implemental stage In the deliberative stage, the consumer is trying to determine what to do, which is then executed during the implemental stage Aaker's and

FIGURE 2
A Taxonomy of Channel Migration Patterns from Trial to Posttrial



Trial
Posttrial
Preference Based
Non-Preference Based
High Marketing Responsiveness?
Yes
No
Yes
Pref > Inertia?
No
High Marketing Responsiveness?
Yes
No
1
2
3
4
1
2
3
4
Yes
No
High Marketing Responsiveness?
Yes
Pref > Inertia?
No
Yes
No
High Marketing Responsiveness?
Stayers
Decision strategy change—Change in marketing responsiveness
Same decision strategy—Change in marketing responsiveness
Decision strategy change—Same marketing responsiveness

Notes Customers in Category 1 have well-established preferences for various channels but can be influenced by marketing activities to switch channels Customers in Category 2 have well-established preferences but are less influenced by marketing activities For example, they always buy on the Internet, and marketing has little influence on which channel they choose Customers in Category 3 tend to use the channel they used the previous time, unless marketing directs them to do otherwise These customers are habitual, but their habits can rather easily be changed Customers in Category 4 are also inertial but pay little attention to marketing They will use the same channel out of habit until an unobserved factor induces them to use a different channel For example, these customers may start off buying from the catalog, but for a particular purchase, they may be pressed for time and therefore use the Internet They then continue using the Internet The figure also shows the possibility that the process does not change, that is, the customer is a stayer This is signified by the solid lines in the figure

Gollwitzer and Bayer's work suggests two stages of decision making, and thus we adopt a two-stage framework (Figure 2) However, more stages could be hypothesized (Fader, Hardie, and Huang 2004, Heilman, Douglas, and Wright 2000), and this could be an avenue for further research

The theoretical concept at work in decision process evolution is fundamentally one of learning What is being learned is the decision process (i e , how the customer will go about choosing which channel to use to make a purchase) Therefore, learning means that the customer determines his or her channel preferences, how he or she will respond to the firm's marketing communications, and to what extent he or she will simplify things by using the same channel used previously In terms of Gollwitzer and Bayer's (1999) theory, the customer first adopts a deliberative mind-set, determining what his or her decision process will be After this process is learned, the customer adopts an implemental mind-set, executing the chosen decision process

This clarifies *what* is being learned—the decision process—which in turn prompts the question of *why* it is being learned There are at least three reasons

1 *Motivation and ability* Motivation and ability are prerequisites to learning (Bettman and Park 1980, Hoch and Deighton 1989, MacInnis, Moorman, and Jaworski 1991) These factors are salient when the cost of an incorrect decision is high For example, the customer may buy a product for a specific event using a catalog, but if the product is delivered late, the customer pays a cost by not having it when it was needed These factors are also relevant when customers have the ability to evaluate their decisions The channel experience is easy to evaluate in terms of service convenience, effort, and so on (Verhoef, Neslin, and Vroomen 2007)
2 *Lack of task familiarity* Learning is more likely to take place when customers are not familiar with the task at hand (Alba and Hutchinson 1987, Hoch and Deighton 1989, Johnson and Russo 1984) For example, newly acquired customers may have experience with buying on the Internet or with the policies of certain stores but not with the channels offered by the particular company for which they have just become a customer Thus, when they are not familiar with the channel environment, there are important things for them to learn
3 *Unsatisfying experiences* An unsatisfying experience (e g , a channel was not as convenient as expected) may cause the customer to reassess and try another channel Previous research has shown that unsatisfying experiences can have a profound impact on future behavior (Mattila 2003, Weiner 1986)

In summary, a customer's decision processes should evolve because of learning, to the extent that motivation and ability, lack of task familiarity, and unsatisfying experiences are present [1] These factors can be set in motion in several contexts (e g , directly after the customer has been acquired, when there is an abrupt change in the environment, Moe and Yang 2009) Therefore, we advance the following hypothesis

H_1 The channel choice process for the average customer evolves over time

We specify "average customer" because the factors driving learning—motivation and ability, lack of task familiarity, and unsatisfying experience—vary across customers Some customers may be uninvolved shoppers and thus not motivated to evaluate their channel experience Some (e g , those who shop for others' in addition to their own needs) may not fully be able to evaluate the outcome of their channel choice Others may be so experienced with shopping that they are highly familiar with the channel selection process Some will have unsatisfying experiences, others will not As a result, we hypothesize the following

H_2 The likelihood that the channel decision process evolves varies across customers

We now turn to hypothesizing the patterns of evolution most likely to surface when we classify customers into the taxonomy depicted in Figure 2 The literature suggests the trial stage will be relatively less driven by preferences than the posttrial stage (Heilman, Douglas, and Wright 2000, Meyer and Sathi 1985) Gollwitzer and Bayer (1999) suggest that when customers are in a deliberative mind-set, they are uncertain about their goals In the channel choice context this means that they are unsure of what channel attributes are relevant and how channels rate on those attributes This suggests that consumers are less (more) certain of their channel preferences when they are in the trial (posttrial) stage This leads to the following hypothesis

H_3 The trial stage of the customer decision process is less preference dominated than the posttrial stage

The question of which channel to choose is inherently more challenging for a newly acquired customer or a customer facing a new channel environment Therefore, the trial stage of the customer decision process is characterized by complexity as well as goal uncertainty Consumers are known to resort to simplifying heuristics in such situations (Payne, Bettman, and Johnson 1992, Tversky and Kahneman 1974) One possible heuristic, essentially the availability heuristic (Tversky and Kahneman 1974), would be to bias current channel choices toward the channel last chosen This would apply to the trial stage However, as consumers make more choices and become more familiar with the channel choice task, that task becomes less complex and consumers develop clearer goals This suggests that consumers are more (less) likely to rely on heuristics and inertia in the trial (posttrial) stage Therefore, we propose the following

H_4 The trial stage of the customer decision process is more inertia dominated than the posttrial stage

Gollwitzer and Bayer (1999) theorize that consumers in the deliberative stage have an open mind-set and are responsive to information When they move to the implemental stage, they have less need for information, so communications are less influential Previous work has explored temporal differences in marketing effects Narayanan, Manchanda, and Chintagunta (2005) find that marketing communications reduce uncertainty about pharmaceutical product quality in the early launch phases and reinforce preferences in subsequent stages. Overall, information has a lower impact over time (see Figure 1 in Narayanan, Manchanda, and Chintagunta 2005). Similarly, Lee and Ariely (2006) show that promotion effectiveness varies depending on the consumer's mind-set (i.e., deliberative vs. implemental) and, in particular, that it is greater when consumers' goals are less well defined. These considerations suggest the following hypothesis:

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[1] Note that although we emphasize the role of learning, there are other potential reasons the decision process might change In the channel choice context, these would include obtaining better Internet connectivity

H_5: The trial stage should be more marketing responsive than the posttrial stage.

Methodology

Following our goals, we sought to develop a methodology for determining whether the customer channel choice decision process evolves over time, how this differs across customers, and how the trial stage process compares with the posttrial stage process. To accomplish this, we build on previous work (Ansari, Mela, and Neslin 2008; Thomas and Sullivan 2005) and develop an analysis consisting of two components: (1) a model that captures the evolution process and (2) two logit channel choice models, one for the trial stage and the other for the posttrial stage. All parameters in these models vary across customers, so we can examine how the evolution process differs from customer to customer and distinguish fast evolvers (learners) and slower evolvers (stayers).

The evolution component quantifies how many purchase occasions the customer takes to transition from the trial to the posttrial stage. We use the purchase occasion as our unit of analysis because our theory posits that the decision process changes as a result of learning from the customer's channel experiences. Specifically, we analyze the number of purchase occasions it takes for the customer to evolve from the trial to the posttrial stage using a simple geometric distribution. Specifically, let q_h be the conditional probability on any given purchase occasion customer h moves from the trial to the posttrial stage, given the customer has not moved yet, and let p_{ht} be the probability customer h has moved to the posttrial stage by the tth purchase occasion. These two quantities are related as follows:

$$p_{ht} = 1-(1-q_h)^{t-1}. \tag{2}$$

This is because $(1-q_h)^{t-1}$ is the probability the customer has not moved by the t-th purchase occasion, so the converse, $1-(1-q_h)^{t-1}$, is the probability the customer has moved by the t-th purchase occasion. Note that p_{ht} is an increasing function of q_h (the more likely the customer is to change on any given purchase occasion, the more likely it is that the customer will have changed by purchase occasion t) and an increasing function of t (the more purchase occasions, the more likely it is that the customer will have evolved).

The geometric distribution with a single parameter (q_h) is parsimonious, though it implies that the most likely time for the customer to evolve is immediately after acquisition or after the decision environment changes. To investigate this assumption, we tested two alternative distributions (the discrete Weibull and a conditional logit). The results show that the geometric specification outperformed the others (see Web Appendix W1 at http://www.marketing-power.com/jmnov11). We also note that the estimated values of q_h suggest that the mean time customers take to evolve to the posttrial stage is 2.3 purchase occasions, with a standard deviation of 5.4. This means there is much variability in evolution rates, and by no means do most customers evolve right away.

The second component of our analysis consists of two logit channel choice models, one for the trial stage and one for the posttrial stage. The term U_{hjt} represents the utility that customer h derives from choosing channel j in purchase occasion t. We distinguish between U^0 and U^1, where the superscript 0 indicates trial and 1 indicates posttrial. Therefore, U^0_{hjt} is the utility for customer h in choosing channel j at purchase occasion t, given the customer is in the trial stage, and U^1_{hjt} is the utility of choosing channel j at purchase occasion t, given the customer is in the posttrial stage. These utilities are a function of the factors shown in Equation 1 and Figure 1:

$$U^0_{hjt} = \alpha^0_{hj} + \beta^0_{1hj}CS_{ht} + \beta^0_{2hj}ES_{ht} + \beta^0_{3h}LC_{hjt} + \varepsilon^0_{hjt}, \quad \text{and} \tag{3}$$

$$U^1_{hjt} = \alpha^1_{hj} + \beta^1_{1hj}CS_{ht} + \beta^1_{2hj}ES_{ht} + \beta^1_{3h}LC_{hjt} + \varepsilon^1_{uht}, \tag{4}$$

where

α^k_{hj} = customer h's preference for channel j during the trial stage (k = 0) or the posttrial stage (k = 1),

CS_{ht} = number of catalogs sent to customer h during the quarter in which purchase occasion t occurs,

ES_{ht} = number of e-mails sent to customer h during the quarter in which purchase occasion t occurs,

LC_{hjt} = 1 if customer h purchased from channel j on the purchase occasion before purchase occasion t and 0 if otherwise. This captures state dependence,[2]

β^k_{mhj} = impact of catalogs (m = 1) or e-mails (m = 2) on customer h's utility for channel j during the trial stage (k = 0) or the posttrial stage (k = 1),

β^k_{3h} = impact of the previous purchase being in a particular channel on the utility for that channel, for customer h at purchase occasion t, during the trial stage (k = 0) or the posttrial stage (k = 1), and

ε^k_{hjt} = error term for customer h for channel j during the trial stage (k = 0) or the posttrial stage (k = 1) for purchase occasion t. For example, this includes situational factors not directly observable by the researcher.

The term α^k_{hj} captures channel preferences, β^k_{mhj} captures the importance of marketing, and β^k_{3h} captures the importance of inertia or state dependence. The relative sizes of these customer-specific parameters enable us to classify customers into the categories defined in Figure 2, both before and after they change decision processes.

Using Equations 3 and 4 and assuming an extreme value distribution for the error terms, we have two logit choice models. Equation 2 indicates the likelihood the customer is using the trial or posttrial model at purchase occasion t. Combining these components yields the following probability customer h chooses channel j at purchase occasion t.[3]

---

[2] State dependence refers to the influence of previous choices on current choices. We used a simple zero-one formulation of the state dependence variable (LC) because previous research is dominated by the operationalization of state dependence to equal 1 if the alternative was chosen at the previous purchase occasion (e.g., Ansari, Mela, and Neslin 2008; Thomas and Sullivan 2005).

$$(5)\quad P_{hjt} = (1-p_{ht})\left(\frac{\exp(U^0_{hjt})}{\sum_{j=1}^{J}\exp(U^0_{hjt})}\right) + p_{ht}\left(\frac{\exp(U^1_{hjt})}{\sum_{j=1}^{J}\exp(U^1_{hjt})}\right)$$

With probability $(1-p_{ht})$, the customer is still in the trial stage and thus is using the first logit model, with probability p_{ht}, the customer has evolved and is using the second logit model. On the customer's first purchase occasion, $t = 1$, so $p_{ht} = 0$ (Equation 2), and the customer's decision process is driven entirely by the trial model. Over time, p_{ht} increases to a degree determined by the customer's parameter q_h, and the process becomes increasingly driven by the posttrial model. For any purchase occasion, the customer's probability of choosing channel j is a weighted average of the trial and posttrial models, the weights being the likelihood that the customer is in the trial stage or the posttrial stage, respectively. Because the weight placed on the posttrial model increases as the customer accumulates more purchases (Equation 2), the posttrial model becomes more important as purchases accumulate.

Data and Estimation

Our main data set is from a major European book retailer operating in one country. The retailer uses three sales channels—physical retail stores, catalogs, and the Internet—and uses a subscription business model. Thus, to be eligible to purchase, each customer must become a member. A code is associated with each customer, tracking each time she or he purchases and from which channel. Therefore, we have information on which channel each customer selected on each purchase occasion, the date of each purchase, how much was spent, the number and types of communications (e-mails and catalogs) each customer received and when they were received, and age and gender demographics.

Each channel shares the same assortment and price. Communications were not targeted according to channel usage. This means that each channel was treated the same in terms of marketing activities. This gives us the opportunity to measure intrinsic customer preferences for each channel.

The period of observation is January 2002–June 2006. The retailer monitored customers and made customer-marketing decisions on a quarterly basis. Therefore, we assemble each customer's purchase occasions, channel choice, and the catalogs and e-mails received on a quarterly basis. On the rare occasions when there was more than one purchase occasion in a quarter (this happened in only 4.2% of the 14,985 customer–quarter observations), we used the single purchase occasion. We found no difference in the results when we estimated the model using all purchase occasions.

We sample a cohort of new customers who live in at least one store's service area and who entered into a subscription agreement with the company during the fourth quarter of 2001. We focus on a static sample of active customers (i.e., customers having an active relationship with the company between January 2002 and June 2006) with all three channels available throughout the relationship. The sample size is 1018 households. Table 1 presents descriptive information about the sample. We use Bayesian estimation (see Web Appendix W2 at http://www.marketingpower.com/jmnov11) to estimate the model.

Catalogs and e-mails sent (CS_{ht} and ES_{ht}) can depend on the customer's past choices and thus might be endogenous. We used an approach similar to Gonul, Kim, and Shi (2000) to minimize endogeneity bias (see Web Appendix W3 at http://www.marketingpower.com/jmnov11).

TABLE 1
Descriptive Statistics of the Selected Cohort of Customers (n = 1018)

Variable	M	SD	Min	Max
Average number of purchase occasions (per year)	3.1	1.1	0	4.0
Average number of purchase occasions over relationship	14.7	2.9	7.0	18.0
Average returns (in US$ per quarter)	4	3.5	0	104.4
Average number of catalogs received (per quarter)	2.0	.7	0	4.0
Average number of e-mails received (per quarter)	.7	2.0	0	12.0
Age (years)	43.8	14.6	21.0	88.0
Gender (male)	35.2%			

Channel Usage[a]	% of Customers	Average Number of Purchase Occasions per Customer
Mainly catalog	27.6%	14.6
Mainly Internet	.6%	14.8
Mainly store	42.4%	15.3
Catalog and store	15.4%	13.4
Catalog and Internet	8.4%	14.7
Internet and store	1.2%	15.3
Catalog, Internet, and store	4.3%	14.6

[a]"Mainly" means that at least 95% of purchases were made on that channel. Similarly, we classified as two-channel/three-channel users those customers who made at least 95% of purchases using two channels/three channels.

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[3] We also estimated Equation 5 with interactions effects and/or diminishing returns to marketing investments (e.g., Thomas and Sullivan 2005, Venkatesan, Kumar, and Ravishanker 2007). In addition, we tested a model with a catalog stock variable that allows for cumulative and carryover effects as the customer gets more catalogs. However, the fit of all these models was lower, and the interpretation of the parameters estimates was essentially identical.

Results

The Existence of Choice Evolution and Its Variation Across Customers

We test for the existence of decision process evolution (H_1) by comparing our proposed model (Equations 2–5) with a logit model that does not distinguish between trial and posttrial stages (Model 1)[4] We test whether the likelihood of evolution varies across customers (H_2) by comparing the proposed model with a logit model that assumes each customer starts off using one logit model and moves to another logit model after the same a priori defined number of purchase occasions (nine, Model 2)[5] We compare these models using both the deviance information criterion (DIC) statistic (Spiegelhalter et al 2002) and the hit rate (see Web Appendix W4 at http //www marketingpower com/jmnov11) The proposed model (DIC = 6525 2, hit rate = 72 9%), which assumes a distinct trial and posttrial logit model and a heterogeneous trial period length across customers, is superior to both Model 1 (DIC = 6881 0, hit rate = 57 9%) and Model 2 (DIC = 6648 2, hit rate = 56 9%) These results support H_1 and H_2, indicating the existence of channel choice evolution and suggesting that the likelihood of evolution varies across customers

Prevalence of Decision Process Evolution and Channel Usage of Learners Versus Stayers

The preceding results suggest that customers change decision processes Next, we want to know how prevalent this behavior is To investigate this, we compute the probability that customer h evolves to the posttrial stage by his or her last observed purchase occasion (see Web Appendix W5 at http //www marketingpower com/jmnov11) The expected value of this probability is 22, which means that we expect 22% of customers to have changed decision processes by the end of the observation period We ordered customers according to their individual probability and labeled the 22% highest as the learners The logic is that the customers with the highest probability of changing are the ones we would expect to change by the end of the observation period The remaining customers were classified as stayers (i e , not expected to change by the end of the observation period) The average probability of changing for stayers is 14 and for learners is 49 Using Equation 2, we calculated that, on average, it takes the learner 9 purchase occasions to evolve (see Web Appendix W5 at http //www marketingpower com/jmnov11) By the same token, it takes an average of 32 purchase occasions for a stayer to evolve, indicating a clear separation between the two groups

Table 2 shows learners' versus stayers' usage of various channels and reveals an intriguing finding Stayers are mainly single-channel users, while learners are predominantly multichannel We conducted a sensitivity analysis regarding this finding by relaxing the 95% requirement used to identify single channel customers (see note a in Table 2) We find that this result is robust to the rule for defining a multichannel customer This is an important exploratory finding and a characterization of the multichannel customer previously not demonstrated

Describing and Contrasting the Trial and Posttrial Decision Processes

Table 3 presents the estimates of the mean parameters for the proposed model The intercept estimates suggest that customers prefer the store to the Internet in both trial and posttrial stages This may seem counterintuitive given the popularity of the Internet in book retailing However, the customers in our sample essentially had joined a loyalty club for a book retailer and therefore presumably were avid readers It is sensible that such customers would enjoy browsing through books and purchasing in the store Also, the stores were a relatively new channel for the retailer, which opened its first store in 2000 Thus, in contrast to the prevailing tradition in the book industry of bookstores being the "incumbent" channel, in our case, the store was the "novel" channel While the store is, on average, preferred over the Internet, the intercept for the catalog over the store is not significant for either the trial or posttrial periods, showing that these two channels were equally preferred on average

We now contrast the trial and posttrial decision processes We tested whether differences between the trial and posttrial coefficients were statistically significant (see

TABLE 2
Stayers Versus Learners: Channel Choice Behavior[a]

	Stayers (793 Customers)	Learners (225 Customers)
Channel Usage		
Mainly catalog	35 4%	—
Mainly Internet	8%	—
Mainly store	54 5%	—
Catalog and store	6 2%	48 0%
Catalog and Internet	2 6%	28 9%
Internet and store	1%	4 9%
Catalog, Internet, and store	4%	18 2%
Multiple-Channel Shopper		
Yes	9 3%	100 0%
Two-channel buyer	8 9%	81 8%
Three-channel buyer	4%	18 2%
No	90 7%	—

[a] "Mainly" means that at least 95% of purchases were made on that channel Similarly, we classified as two-channel/three-channel users those customers who made at least 95% of purchases using two channels/three channels

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[4] Model 1 essentially assumes that $\alpha^0_{hj} = \alpha^1_{hj}$ and $\beta^0_{mhj} = \beta^0_{mhj}$ for $m = 1, 2, 3$ in Equations 3–4

[5] Nine is the median number of purchase occasions We tested other numbers and also found the proposed model was superior (6715 9 for 3 purchase occasions, 6725 5 for 5, 6804 3 for 12, and 6970 6 for 15 versus DIC = 6525 8 for the proposed model) The model with 1 purchase occasion yielded DIC = 6631 1 but did not converge We also tested a model for which q_h was constant across customers (DIC = 10,204 0), but it also did not converge

TABLE 3
Estimates of Parameter Means: Two-Stage Channel Choice Model

	Catalog Versus Store		Internet Versus Store	
	Parameter[a]	Elasticity[b]	Parameter[a]	Elasticity[b]
Intercept				
Trial	85 (47)	—	**–2 48** (39)	—
Posttrial	38 (92)	—	**–3 78** (46)	—
Catalogs Sent				
Trial	**–1 45** (36)	**–7 24**	**–9 10** (97)	**–20 56**
Posttrial	– 12 (63)	– 33	63 (59)	1 83
E-mails Sent				
Trial	– 03 (61)	– 46	**3 28** (75)	**4 90**
Posttrial	**2 35** (34)	**93**	41 (70)	– 49
State Dependence				
Trial			**4 09** (60)	
Posttrial			**3 14** (62)	

[a] A positive coefficient means that a customer is more likely to choose channel j than the base channel The base channel is the store

[b] We computed elasticities at the mean value of the continuous variables and the mode of the categorical variables

Notes Bold indicates that the 95% posterior distribution for the parameter does not include zero The standard deviation of the posterior distribution is in parentheses For identification purposes, we set one channel (the store) as the base

Web Appendix W6 at http //www marketingpower com/ jmnov11) We found that the state dependence effect is significantly reduced in the posttrial period, suggesting that, on average, people become less inertial By a similar token, we found that preferences for the store versus the Internet significantly increase This suggests that in the posttrial stage, customers base their decision processes more on channel preferences than habitual behavior, as we predict in H_3 and H_4

We have four marketing coefficients for each stage (catalog's impact on catalog vs store and Internet vs store, and e-mail's impact on catalog vs store vs Internet vs store) In three of four cases, the marketing coefficient becomes significantly smaller in the posttrial model, meaning that customers evolve toward a decision process in which they have less need for marketing information, in support of H_5

The preceding conclusions are based on comparing the magnitudes of coefficients We also examined pseudo t-statistics, calculated as the mean value of the coefficient divided by its standard deviation (LeSage and Fischer 2010, p 429) These results are consistent with the magnitude results noted previously (the Internet vs store preference pseudo t-statistic increases from 2 48/ 39 = 6 36 in the trial period to 3 78/ 46 = 8 22 in the posttrial period, the state dependence statistic decreases from 6 82 to 5 06, and the pseudo t-statistics for marketing decrease in the three cases in which the magnitudes decrease and increase in the one case in which the magnitude increases)

In summary, these results suggest that the decision process evolves in two main ways (1) Channel preferences become more important and state dependence less important over time (H_3 and H_4), and (2) in general, marketing communication becomes less effective (H_5) It is noteworthy that our findings indicate consumers do not always link catalogs and e-mails to their "natural" purchase channels, the catalog and Internet, respectively For example, the negative sign for the catalog's impact on catalog versus store suggests that catalogs "promote" the store The catalogs used by this company did not include store promotions but did list the locations of stores This could account for the tendency of catalogs to promote store choice over catalog in the trial period Another possible explanation is the "research shopper" phenomenon (Verhoef, Neslin, and Vroomen 2007) Research shopping means the customer uses one channel for search (gathering information) and a different channel for purchase For example, customers might find catalogs to be a convenient way to investigate what products are available, but the store is a superior purchase channel for them because they can sample the product by thumbing through the books We also found that e-mails promote catalogs versus store in the posttrial period It may be that readers of e-mails are goal-directed and thus gather all the information they need from the e-mail They then find it more convenient to purchase the product from the catalog, which just requires a phone call, than from the store Blattberg, Kim, and Neslin (2008, p 647) articulate a broader view of this by raising the notion of channel/marketing congruency They state that this is an underresearched area, and although it is not the main purpose of this article, our results add to the substantive knowledge base on this issue

Characterizing Evolution Patterns

We now focus on learners and classify them in terms of the taxonomy depicted in Figure 2, in other words, we quantify the extent to which different decision processes are employed in the trial versus posttrial stages and examine the patterns by which learners evolve from one process to another The customer-level parameter estimates enable us to accomplish this classification

By comparing the magnitudes of the channel preference parameters with the state dependence parameters, we classify customers' decision processes as either preference based or non–preference based For example, if customer h's state dependence parameter is higher than his or her preference for the catalog over the store and the Internet over the store (in absolute values), we classify this customer as non–preference based (for details, see Table 4, Panel A)

TABLE 4
Classifying Learners

A: Preference Based or Non–Preference Based

Categories	Decision Strategy	Classification Rule[a]
1	Preference based	State dependence < Preference (C vs S) State dependence < Preference (I vs S)
2	Preference based	State dependence > Preference (C vs S) State dependence < Preference (I vs S)
3	Preference based	State dependence < Preference (C vs S) State dependence > Preference (I vs S)
4	Non–preference based	State dependence > Preference (C vs S) State dependence > Preference (I vs S)

B High Marketing Versus Low Marketing Responsiveness

Categories[b]	Marketing Responsiveness[c]	Classification Rule[a]
1	High	Marketing elasticity (C vs S) > Median marketing elasticity (C vs S) Marketing elasticity (I vs S) > Median marketing elasticity (I vs S)
2	High	Marketing elasticity (C vs S) < Median marketing elasticity (C vs S) Marketing elasticity (I vs S) > Median marketing elasticity (I vs S)
3	High	Marketing elasticity (C vs S) > Median marketing elasticity (C vs S) Marketing elasticity (I vs S) < Median marketing elasticity (I vs S)
4	Low	Marketing elasticity (C vs S) < Median marketing elasticity (C vs S) Marketing elasticity (I vs S) < Median marketing elasticity (I vs S)

[a] C stands for the catalog, I for the Internet, and S for the store

[b] We have four categories in total (three under "High Marketing Responsiveness" and one under "Low Marketing Responsiveness") and consider two types of direct marketing communications (e-mails sent and catalogs sent) Therefore, we have a total of $4^2 = 16$ possible outcomes

[c] We classify customers as low responsive to marketing only if all their marketing elasticities are less than the median values (or are not significant) across both the trial and posttrial models

After classifying customers as preference or non–preference based, we further distinguish them according to their marketing responsiveness We compare individual marketing elasticities with the median value across customers and classify customers in the high marketing responsiveness group if e-mails or catalog elasticities are greater than the respective median elasticities (for details, see Table 4, Panel B)

We used the aforementioned decision rules to classify each learner into one of the four decision process categories We then "cross-tabbed" category membership by decision stage to examine the patterns by which customers evolve from one decision process category to another Figure 3 shows these evolutions The key findings are as expected a tendency to evolve from non–preference-based to preference-based decision making and a tendency to evolve to lower marketing responsiveness In particular, Figure 3 highlights two main types of evolutions from Trial Category 3 to Posttrial Category 1 (42% of all learners), and from trial Category 3 to Posttrial Category 2 (51%) Both these evolutions are from a non–preference-based to a preference-based decision process

Customers in Category 3 are responsive to marketing and non–preference based This suggests that marketing bounces them from channel to channel during the trial stage However, these customers eventually form strong channel preferences, which makes them preference-based decision makers Some of them remain responsive to marketing (i e , marketing can still influence their choice), but for the majority, marketing diminishes in importance

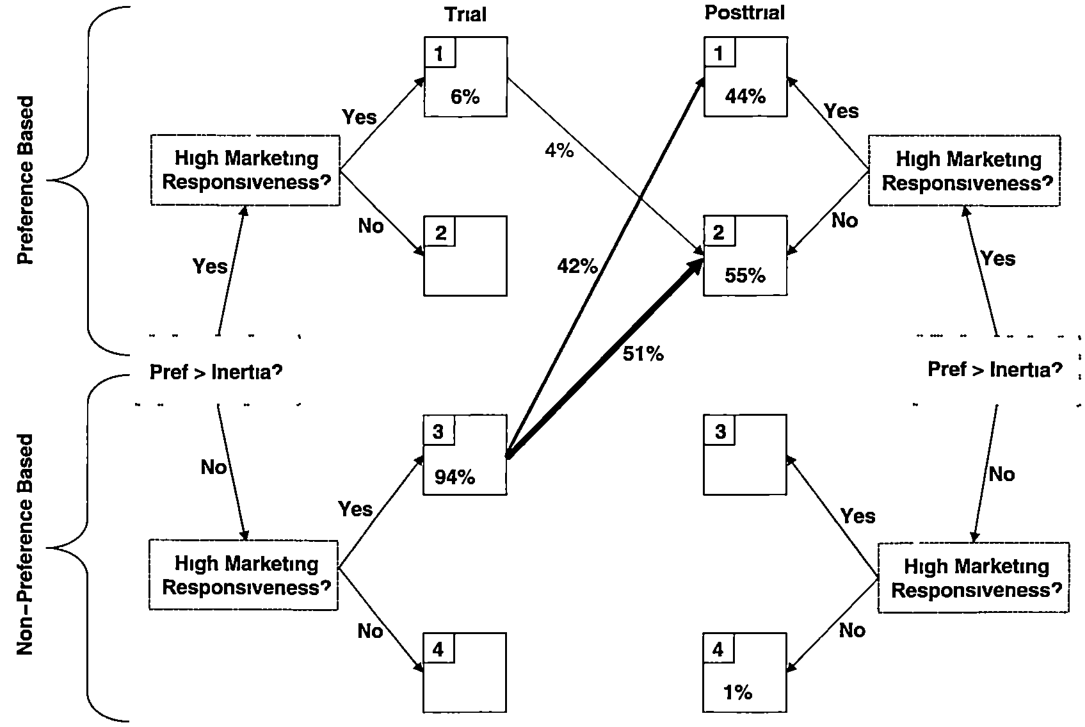
Robustness Checks

Robustness with Respect to Assumptions

We conducted robustness checks of some of our key assumptions by (1) investigating whether observed heterogeneity and time variance influence the customer's propensity to evolve and (2) modeling a relationship between trial and posttrial parameters To investigate the first issue, we estimated models with q_h a function of customer variables (age, gender Model A) and time-varying variables including marketing (Model B), lagged channel choice, lagged product returns, age, and gender (Model C), and lagged product returns (Model D) We found that none of these models improved over our proposed model, which assumes that q_h varies randomly across customers and does not change over time (see Table 5) The proposed model's superiority to Model B indicates that marketing does not significantly affect the length of the trial period The comparison with Model D suggests that at least one measure of unsatisfying experience—product returns—does not encourage learning A possible reason for this is that returning a book is not an unsatisfying experience This is in line with previous work showing that when firms effectively manage service failure, a negative experience might turn into a positive one Product returns can contribute to generate customer satisfaction and reinforce the relationship with the firm (Petersen and Kumar 2009)

To investigate the second issue, we posited a general correlation matrix in model parameters across both stages or made the posttrial parameters functions of the trial parameters plus age, gender, and first channel chosen None of these models fit better than the proposed model, or they

FIGURE 3
Estimated Trial to Posttrial Learner Migration Patterns



Notes Only paths greater than 2% threshold are represented From Table 5, Panel B, customers are classified as more marketing responsive if any of their four marketing elasticities (catalogs catalog vs store, catalogs Internet vs store, e-mails catalog vs store, e-mails Internet vs store) are above the median for that elasticity across customers As long as the customer is exceptionally responsive to some form of marketing, we classify him or her as highly responsive Although we could have used other classification rules, the important issue is not the level of responsiveness per se but rather how marketing responsiveness changes from the trial to the posttrial stage Using this rule, we find that 100% of the learners are highly marketing responsive in the trial period and 44% in the posttrial period We also tested a more restrictive classification rule, requiring two marketing elasticities, not one, to be greater than the median Using this rule, the number of responsive consumers decreases (from 100% to 91 6% in the trial period, and from 44% to 3 6% posttrial), but the same general finding holds Learners are less marketing sensitive after they change

did not converge (for details, see the Web Appendix W6 at http //www marketingpower com/jmnov11)

Overall, we find that the relatively simple proposed model performed better than plausible though more complex models It might be that the more complex models overtaxed the data or that the proposed model captures the essence of decision process evolution, so that elaborations on that model do not add significantly more explanatory power

Replication in a Different Business Context

We perform a second empirical analysis to validate our results in a different business context We obtained data from a U S retailer that sells durables and apparel through catalogs, stores, and the Internet The company opened two stores in July 2000 and May 2001 that were relatively close to each other We select a sample of customers who first purchased from one of these stores after May 2001 and lived within 15 miles of these stores Therefore, we include only customers for whom the catalog, Internet, and store channels were available The observation period is May 2001–September 2004 We include only active customers who made at least three purchases The final sample size is 506 households We have information on channel choice and catalog communications Table 6 summarizes the data

This is a useful data set because the opening of the stores is a discontinuity in the customer experience Our theory posits that the decision process evolves when consumers have the motivation and ability to learn and are unfamiliar with the task These conditions apply to our first data set, because the customer was just acquired We believe these conditions would hold in the case of the second data set as well, because there has been an abrupt change in the channel environment Indeed, Moe and Yang (2009) show that disruptive events force consumers to reexamine and possibly adjust their preferences and habits

We compare our proposed model with the logit model that does not distinguish between trial and posttrial stages (Model 1) We also compare with a multinomial logit that assumes that each customer changes decision process after the same a priori defined number (15) of purchase occasions (Model 2)[6] The DIC statistics confirm the superiority of the proposed model over Models 1 and 2 ($\text{DIC}_{\text{proposed}} = 11{,}711$,

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[6] We use 15 because this was the median number of purchase occasions We tested other numbers and also found the proposed model was superior (DIC = 12, 085 5 for 3 purchase occasions, 11,995 7 for 5, 12,371 5 for 12, and 12,275 5 for 18 versus DIC = 11,711 0 for the proposed model)

TABLE 5
Robustness Checks for the Proposed Model

Model	Description	DIC	Hit Rate
Proposed model	Two-stage multinomial channel choice model (Equations 2–5)	6525 8	72 9%
Model A	Two-stage multinomial channel choice model (with q_h a function of age and gender)	6598 2	53 1%
Model B	Two-stage multinomial channel choice model (with q_{ht} a function of marketing)	6999 4	49 2%
Model C	Two-stage multinomial channel choice model (with q_{ht} a function of age, gender, lagged number of channel used, and lagged returns)	7284 8	43 9%
Model D	Two-stage multinomial channel choice model (with q_{ht} a function of lagged returns)	7202 8	42 4%

$\text{DIC}_{\text{model1}} = 12{,}082$, $\text{DIC}_{\text{model2}} = 12{,}545$) This provides reconfirmation of H_1 and H_2, that the customer decision process evolves and that this evolution is heterogeneous across customers The expected value of the probability of changing by the end of the data collection is 35, which means that we expect 35% of customers to have changed their decision processes The average probability of changing for stayers is 25 and for learners is 53 We also find that the expected number of purchase occasions a learner needs to update his or her decision process is 11 In contrast, it takes an average of 39 purchase occasions for a stayer to change

TABLE 6
Descriptive Statistics for the Durable and Apparel Data Set (n = 506)

Variable	M	SD	Min	Max
Average number of purchase occasions (per year)	5 7	3 1	1 0	20 0
Average number of purchase occasions over relationship	14 9	5 7	9 0	30 0
Average number of returns (per year)	6	1 1	0	10 0
Average number of catalogs received (per week)	6	8	0	6 0
Age (years)	53 4	11 2	33 0	97 0
Channel Usage[a]				
Mainly catalog	9 3%			
Mainly Internet	5 7%			
Mainly store	13 6%			
Catalog and store	20 6%			
Catalog and Internet	4 0%			
Internet and store	3 8%			
Catalog, Internet, and store	43 1%			

[a] "Mainly" means that at least 95% of purchases were made on that channel Similarly, we classified as two-channel users/three-channel users those customers who made at least 95% of purchases using two channels/three channels

Table 7 presents the estimates for the proposed model The intercept estimates show that the store is preferred over both the catalog and the Internet in the trial stage, and the magnitude increases considerably in the posttrial stage However the pseudo t-statistics for the preference parameters decrease in going from the trial to posttrial stage (from 7 7 to 2 1 for catalog vs store, from 9 6 to 1 9 for Internet vs store) The number of catalogs sent is significant in the trial stage but not in the posttrial stage The pseudo t-statistics for catalogs sent decrease from the trial to posttrial stages (from 5 1 to 0 0 for catalog vs store, from 2 5 to 05 for Internet vs store), consistent with the changes in magnitude In summary, we cannot clearly support an increase in the importance of preference going from the trial to posttrial stage However, we find clear evidence for a decrease in the impact of marketing

Managerial Implications: Identifying Learners and Marketing to Them

Our results have established that there is a learner segment—a segment that significantly changes its decision process within a relatively short time However, two questions naturally arise In concrete terms, who is the learner segment? and Can we use this information to design more effective marketing programs? We answer the first question with a discriminant analysis and the second with a profitability scenario of a "right-channeling" strategy

We hypothesize five variables that should distinguish between learners and stayers

1 *Acquisition channel* Our focal company predominantly uses "street agents" or "door-to-door" agents to acquire customers Street agents approach customers directly outside the company's bookstores, door-to-door agents go directly to prospects' residences We hypothesize that customers acquired through door-to-door agents would be less familiar with the company and its various marketing channels Therefore, they would be more open to information and open to learning about the various channels (i e , they would more likely be learners)
2 *Age* Younger customers should be more open to exploring different channels and thus are more likely to be learners
3 *Gender* We have no particular hypotheses on gender, but given the literature on gender differences in shopping, we thought it was worthwhile to explore this variable
4 *Immediate e-mail suppliers* The firm asks for customers' e-mails only when the customer is acquired Some customers supply their e-mail addresses immediately, while others wait before doing so Therefore, immediate e-mail suppliers are customers who provided their e-mail addresses at the time of acquisition We hypothesize that the immediate suppliers would be more open to information and thus more likely to be learners
5 *Big city dwellers* Customers who live in big cities should be more familiar with various shopping alternative and thus less likely to be learners

Table 8, Panel A, shows the means of these variables for learners and stayers Three of our hypotheses are confirmed Learners are more likely to be acquired through door-to-door agents, they are younger, and they are more likely to

TABLE 7
Estimates of Parameter Means: Two-Stage Channel Choice Model (Durable and Apparel Data Set)

	Catalog Versus Store		Internet Versus Store	
	Parameter[a]	Elasticity[b]	Parameter[a]	Elasticity[b]
Intercept				
Trial	**–1 46** (19)	—	**–2 87** (30)	—
Posttrial	**–33 25** (15 90)	—	**–8 66** (4 60)	—
Catalogs Sent				
Trial	**51** (10)	**22**	**35** (14)	**17**
Posttrial	– 01 (2 82)	04	– 07 (1 44)	09
Distance				
Trial	**14** (02)	—	**14** (03)	—
Posttrial	1 63 (1 08)	—	54 (45)	—
State Dependence				
Trial	– 09 (06)			
Posttrial	**2 35** (2 34)			

[a] A positive coefficient means that a customer is more likely to choose channel j than the base channel The base channel is the store

[b] We computed elasticities at the mean value of the continuous variables and the modal of the categorical variables

Notes Bold indicates that the 95% posterior interval for the parameter does not include zero The standard deviation of the posterior distribution is shown in parentheses

TABLE 8
Discriminant Analysis and Profitability Scenarios of Marketing to Learners

A: Mean Characteristics of Learners and Stayers

Variable	Learners	Stayers	*p*-Value for Difference
Door-to-door agent acquisition	60 9%	49 7%	003
Age	41 2 years	44 5 years	002
Gender	70 2% female	72 4% female	525
Immediate e-mail suppliers	24 9%	2 7%	000
Big city dwellers	52 0%	54 4%	533

B: Classification Matrix of Learners Versus Stayers

	Actual Group Membership		
	Stayer	Learner	Total
Predicted Group Membership (Number)			
Stayer	708	80	788
Learner	85	145	230
Predicted Group Membership (Conditional Probability of Correct Prediction)			
Stayer	89 8%	10 2%	100%
Learner	37 0%	63 0%	100%

Hit Rate = (708+145)/1018 = 83 8%

C· Profitability Analysis· E-Mail-Early Versus E-Mail-Late Strategy[a]

	Profits per Purchase Occasion			Web Use		
Strategy	First Period	Second Period	Entire Period	First Period	Second Period	Entire Period
E-mail early	$16 81	$14 22	$15 52	88 4%	49 4%	68 9%
E-mail late	$11 08	$13 99	$12 54	5 9%	46 2%	26 0%

[a] We used customers who had at least seven purchases We noted the number of e-mails each customer received Then we reallocated them to a 70-30 split for the e-mail-early strategy and a 30-70 split for the e-mail-late strategy The e-mails were used on purchase occasions 1, 2, and 3 (early) and 5, 6, and 7 (late), with the exact number depending on the number of e-mails the customer received and the allocation dictated by the strategy being simulated

supply their e-mail address immediately. Our next step is to estimate the discriminant function to use for classification. Results are shown in Table 8, Panel B.[7] The hit rate is 83.8%, significantly better than the random assignment standard of 65.5% (p-value = .000) (c_{fair} in Lehmann, Gupta, and Steckel 1998, p. 663). The model does not perform equally well in classifying learners: 37% of learners are misclassified. However, 63% of our predicted learners are actually learners, whereas only 10.2% of the predicted stayers turn out to be learners. In summary, the discriminant analysis shows we can identify the learners in concrete terms and classify customers as either learners or stayers.

By definition, the learner segment changes its decision process relatively quickly after acquisition. To illustrate the implications of this and how our discriminant analysis could be used in marketing to this group, we conduct a profitability analysis involving right-channeling learners. We assume the firm's profit margin is higher for Internet purchases (50%) versus catalog or store purchases (30%). Therefore, the company wants to encourage learners to use the Internet, and it knows that e-mails tend to do this (Table 3). The question is, Should those e-mails be used directly after customer acquisition, or later, after the customer has had a chance to get "settled"? Our results suggest the "e-mail-early" approach is better because learners are more receptive to marketing directly after they have been acquired.

The e-mail-early strategy allocates e-mails toward the purchase occasions immediately after the customer has been acquired. The e-mail-late strategy allocates e-mails toward the later purchase occasions. We use the discriminant function to identify learners and the parameter estimates obtained at the individual level to simulate channel choices under each strategy. Table 8, Panel C, summarizes the results and shows that, as we expected, the e-mail-early campaign generates approximately 24% more profits ($15.52 – $12.54/$12.54) by encouraging earlier usage of the less costly Internet channel. This analysis shows that learners can be identified sensibly with concrete measures, and profits can be leveraged through appropriate marketing communication activities.

Conclusions

Key Results and Implications

The central questions of this study are as follows: (1) Do customers evolve to a different channel choice process over time? (2) If so, how many customers evolve? (3) How can we characterize the decision process of customers who evolve? and (4) What are the managerial implications for channel management?

To answer these questions, we characterized the channel choice decision process using the three main factors that previous researchers have used to study channel choice: channel preference, state dependence or inertia, and marketing. We hypothesized that (1) the channel choice decision process evolves over time, (2) the time of this evolution varies across customers, (3) channel preferences become more relevant over time, (4) state dependence becomes less relevant over time, and (5) marketing communication is less effective over time. We developed a two-stage channel choice model to test these hypotheses and answer our key questions. We investigated customer channel choice behavior in a contractual setting in the book retail industry. As a robustness check, we analyzed a U.S. retailer of durables and apparel. Our key findings and managerial implications are as follows:

- Customers' channel choice decision processes evolve over time. This provides managers with the strategic insight that new-to-the-channel customers need to be treated differently from mature customers in terms of channel decisions. Operationally, it means that managers must take into account how recently the customer has been acquired in predicting channel choices.
- A significant portion of customers are expected to shift (ranging from 22% [newly acquired customers] to 35% [new channel introduction]). This suggests that the customer's speed of evolution can serve as a basis for segmentation: learners versus stayers.
- The predominant pattern of evolution is from a more marketing-responsive to a less marketing-responsive decision process. This means that the newly acquired customer or the customer who experiences a new channel introduction is more receptive to right-channeling than the mature customer. In general, mature customers will be less amenable to marketing efforts aimed at getting them to try new channels. This suggests that channel strategies for mature customers should ensure these customers are very satisfied with the service experience of the channel(s) they have chosen to use.
- Learners can be characterized through discriminant analysis, and the discriminant analysis can be used to identify the learner segment. In our case of the book retailer, we found that learners are likely to be acquired through door-to-door agents, immediately provide their e-mail addresses, and be younger. The result is a concrete simulation of how managers can identify learners and how they might market to them. Policy simulation can be used to examine the impact of various marketing strategies. We illustrate how an e-mail-early strategy can increase learners' profitability. Transitioning consumers early into the cheapest Internet channel increased the company's profits by approximately 24%.

The key hypotheses that (1) the customer decision process evolves, (2) the evolution is heterogeneous across customers, and (3) customers become less responsive to marketing over time were confirmed in two databases in very different situations (after the customer is acquired by a book retailer and after the introduction of a new purchase channel by a durables/apparel retailer). We confirmed our hypotheses that the process becomes more preference based and less inertial over time for the book retailer database but not for the durables/apparel database. The importance of preference in the trial stage in the durables/apparel database could be due to customers being highly familiar with purchase channels in this industry. The type of store the company introduced was similar to that of other U.S. competitors. Therefore, adding a store was not an entirely new experience for the customer. In terms of the learning theory that motivates decision process evolution, customers were relatively familiar with the task, which diminished learning.

The most important conceptual contribution of this work is that the customer's channel choice process evolves over time We are encouraged regarding the generalizability of this finding in two databases The underlying theoretical reason for evolution is customer learning, stimulated by three conditions motivation and ability, lack of task familiarity, and dissatisfying experiences To the extent these conditions are present in other decision processes (e g , brand choice, price search, service usage), we would expect this evolution to hold beyond the domain of channel choice

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[7] Note that in addition to the variables in Table 8, Panel B, we added fixed effects for zip code to control more specifically for the location of the customer's residence. We included 256 of these fixed effects in the discriminant analysis.

We do not advocate our model as the only way to model this evolution, the main point is that evolution should be considered in some way We believe the taxonomy we developed for characterizing the channel choice process (Figure 2) is useful and produced a revealing portrait of choice process evolution (Figure 3)

Limitations and Further Research

There are limitations to this study that provide opportunities for further research First, our work is based on what we can observe, namely, customers' purchase histories A well-designed panel survey could enrich the characterization of stayers and learners and, of course, of their decision processes

Second, we estimated different specifications of the proposed model that relax the assumption of independence between trial and posttrial stages Although our results provide support for the independence assumption, the data we used might not be strong enough to pick this relationship up and/or the alternative modeling specifications might overtax the model with too many parameters Additional research could investigate this issue further

Third, the population of interest in this study is heavy users who account for high sales This focuses attention on the best customers and avoids including customers active only during the trial stage Work in the future might examine the evolution of the channel choice decision process for light users while accounting for customer churn This would allow for a more complete analysis of customer retention and profitability

Fourth, we focus on channel choice for the purchase decision and do not investigate search behavior (Verhoef, Neslin, and Vroomen 2007) Further research might explore the choice of channels for both search and purchase and the evolution of these two decision processes, but this would require the availability of both search and choice longitudinal data

Fifth, we examined the impact of a single disruption in the environment on the ensuing transition from a trial to a posttrial decision process A more general analysis would observe several disruptions Related to this is the question of whether, in the face of a disruption, the trial model starts from scratch or is related to the previous decision process the customer was using To explore this, we examined our new store opening data In that case, we had data for a subset (n = 115 customers) who purchased before the opening of the stores For these customers, we estimated a binomial logit model for choosing between the catalog and the Internet during the pre-store-opening period We estimated individual-specific coefficients and correlated them with the individual-specific coefficient we estimated for the trial model We found a correlation of 38 between the intercept terms representing preference for catalog versus Internet and a correlation of 43 between the catalog response coefficients representing impact on catalog choice rather than Internet These correlations were both statistically significant at the 05 level and, in our view, promising given the small sample size and noise level in the data These results also reinforce our conjecture that there was no change in the importance of preference associated with the opening of the store because of already established task familiarity Notably, and consistent with Moe and Yang's view of environment changes as disruptions of customer habits, we found virtually no correlation (– 02) between the state dependence coefficients Overall, this points to the plausibility of multievent modeling in which trial decision processes build on the decision process that existed before the market disruption

Sixth, we did not examine the specific content of e-mails and catalogs as it pertains to channel choice Certainly, the catalog, for example, listed store locations and included the URL of the company's website However, to our knowledge, there were no time-specific campaigns to encourage customers to use various channels An examination of the potential for such campaigns would be interesting grounds for further research

Seventh, a significant finding of our work is that marketing information affects channel choice in the trial stage but does not affect the timing of moving from the trial to the posttrial stage This suggests that evolution is a customer-specific trait Our robustness checks verify this result, but it is possible that in different contexts, marketing could influence not only channel choice but also the speed of evolution It may be possible to design the information content of marketing to influence the timing of evolution This would be supported, for example, by Petty and Cacioppo (1986, p 126), who suggest that the ability to learn can depend on the message We believe this is a fertile area for further research in the context of learning new decision processes, the domain of our work

Eighth, the focus of this study is on the customer channel choice decision process Further research might also investigate whether other aspects of the customers' decisions, particularly purchase incidence and purchase quantity, evolve over time

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Guiyang Xiong & Sundar Bharadwaj

Social Capital of Young Technology Firms and Their IPO Values: The Complementary Role of Relevant Absorptive Capacity

The strategic importance of business-to-business (B2B) relationships is well recognized, but their financial impact remains equivocal. This study links social capital from three types of B2B networks of young technology firms with their initial public offering (IPO) value. The authors identify three relevant types of absorptive capacity that facilitate the transformation of B2B social capital into IPO value. For the transformation to occur, the authors find that young firms need not only the opportunity to access the resources provided by B2B relationships but also the ability to leverage them through the complementary capability—namely, absorptive capacity. They test the hypotheses on a sample of 177 IPOs, and the results are robust to endogeneity concerns and alternative measures. As one of the first studies in marketing–finance interface to focus on young firms, the findings provide novel insights, such as the deleterious financial consequence of having marketing and research-and-development B2B relationships without the relevant absorptive capacity. The authors conclude with a discussion of managerial implications regarding communicating the value of absorptive capacity, disclosure of marketing-related information, and the importance of marketing for young technology firms.

Keywords: business-to-business relationships, social capital, absorptive capacity, stochastic frontier estimation, initial public offering value, marketing–finance interface

The conceptual literature has recognized that business-to-business (B2B) relationships are valuable market-based intangible assets, which constitute social capital that can be transformed into financial value (e.g., Srivastava, Shervani, and Fahey 1998, Van den Bulte and Wuyts 2007). However, prior empirical studies provide conflicting evidence on the role of B2B relationships. Some suggest that these external relationships are a valuable source of resources and thus enhance firm survival and performance (Kalaignanam, Shankar, and Varadarajan 2007, Swaminathan and Moorman 2009, Tuli, Bharadwaj, and Kohli 2010). Conversely, others find that such ties do not always translate into high performance (De Wulf, Odekerken-Schroder, and Iacobucci 2001, Gulati and Higgins 2003, Guo, Lev, and Zhou 2005). These mixed findings suggest that it might not be that the mere presence or absence of B2B relationships is critical but that the phenomenon is more complex, thus warranting further study.

Technology start-ups are an appropriate context to study the value of B2B relationships.[1] In particular, B2B relationships can be of importance to young technology firms and their firm value for several reasons. First, such firms typically do not have the internal resources and capabilities and the organizational slack of established firms and thus rely on external B2B relationships for access to critical resources and knowledge (e.g., Stuart 1998, Uzzi 1999). Second, investors are likely to seek indirect signals to assess young firms because these firms have short observable histories and limited performance records (e.g., Dekinder and Kohli 2008, Stuart, Hoang, and Hybels 1999). Previous literature has acknowledged that B2B relationships can not only signal the legitimacy of new ventures but also help develop corporate reputations (e.g., Florin, Lubatkin, and Schulze 2003). Finally, investors' uncertainty about future prospects is especially high for start-ups in

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[1] We use the terms "start-ups" and "young firms" interchangeably. Although this might be debatable in some circumstances, it seems appropriate for this study because the average of the firms in our sample is 7.7 years on the day of the IPO.

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high-technology industries (e.g., Aldrich and Fiol 1994). In addition, B2B relationships can help young technology firms track dynamic environmental changes and boost innovation speed, product adoption, and firm growth (e.g., Rindfleisch and Moorman 2001) and thus lower investors' uncertainty in evaluating a firm's value potential.

Against this backdrop, this study explores the conditions under which B2B relationships increase start-ups' shareholder value. We conduct this research in a unique financial context, the initial public offering (IPO) market, in which a firm seeks public equity investment for the first time. The IPO is a crucial event and the most important corporate financing and strategic development decision for a start-up firm. Although IPO research has proliferated in finance and accounting, marketing scholars have not paid much attention to this area, though marketing strategies can play an important role in a young firm's performance (DeKinder and Kohli 2008; Luo 2008). Moreover, IPO value provides a systematic forward-looking evaluation of young firms' future performance, which is ideal for this research context, because start-up firm value depends to a large extent on the expected future performance and growth opportunities, while historical financial performance measures, such as sales or profitability, are often zero or negative for young firms.

Our findings suggest that mere access to social capital in certain B2B networks does not necessarily benefit a young firm's IPO market capitalization. However, young firms with strong absorptive capacity are better able to leverage the social capital accessible to enhance their IPO values. Thus, this study helps start-up managers develop a better understanding of how to realize firm value in the stock market by wisely deploying limited resources. Specifically, they will understand why certain B2B relationships may or may not pay off, as well as the complementary capabilities required for each type of relationship to maximize its value potential. In addition, we provide evidence that marketing efforts help not only build up social capital but also realize its financial value. This finding helps senior marketing managers (e.g., chief marketing officers) better communicate marketing's value. The study also provides managers with guidelines for their disclosure strategy.

The study makes two other important contributions. First, it contributes to the emerging contingency perspective on the marketing–finance interface, which is an attempt to identify and demonstrate the conditions under which marketing activities and assets are associated with stock market outcomes (e.g., Bharadwaj, Tuli, and Bonfrer 2011). Second, this stream of literature almost exclusively focuses on large established firms and has, for the most part, ignored start-up firms. Start-ups are a critical component of the U.S. economy, serving as sources of job creation and greater productivity and productivity gains than established firms (Kauffman Foundation Report 2008). There are significant differences in the management and valuation of young firms compared with mature firms (e.g., Sheth and Sisodia 2001). Thus, the findings from research on mature firms may not apply to start-ups. Our findings provide unique insights not only for technology entrepreneurs and managers but also for new venture investors.

We organize the rest of the article as follows. First, we review two streams of literature and highlight our theoretical contributions. Then, we develop the conceptual framework and specify our hypotheses, relying on both established theory and five in-depth interviews with domain experts with investment banking experience. Next, we present data, methods, and empirical results. We conclude with a discussion of the results and implications for research and practice.

Prior Research

B2B Relationships

Previous research provides mixed results about the influence of B2B relationships on firm performance. Some strategic alliance research shows that forming alliances increases alliance participants' stock market performance (e.g., Chan et al. 1997; Das, Sen, and Sengupta 1998; Kalaignanam, Shankar, and Varadarajan 2007; Swaminathan and Moorman 2009). In contrast, other studies find that alliances have a value-reducing effect (Guo, Lev, and Zhou 2005) or have no significant impact on firm value (Gulati and Higgins 2003). Among the studies focusing on customer relationships, some suggest that relational constructs such as relationship quality and satisfaction positively influence the seller's sales, profit, and share of wallet (e.g., Morgan and Hunt 1994; Tuli, Bharadwaj and Kohli 2010), while other researchers show no significant impact (e.g., De Wulf, Odekerken-Schroder, and Iacobucci 2001; Gruen, Summers, and Acito 2000). Palmatier et al.'s (2006) review concludes that the mixed findings imply that the effect of B2B relationships on firm performance may be contingent on other nonmodeled factors.

Absorptive Capacity

Cohen and Levinthal (1990) introduce the concept of absorptive capacity as a firm's ability to identify, assimilate, and exploit external knowledge. Research on absorptive capacity has proliferated since then because the construct provides a unique viewpoint and can be applied to many research areas (Lane, Koka, and Pathak 2006). Absorptive capacity has been associated with both intra- and interorganizational learning and is recognized as playing a key role in B2B relationship performance (e.g., Lane and Lubatkin 1998). Scholars have unveiled the importance of absorbing implicit or tacit knowledge (i.e., "know-how" in addition to the simple "know-what"; e.g., Narasimhan, Rajiv, and Dutta 2006; Simonin 1999). However, extant studies have almost exclusively focused on research and development (R&D) (Lane, Koka, and Pathak 2006), largely ignoring the learning and knowledge absorption that commonly exist in other contexts.

In this study, we incorporate these two streams of literature in addition to marketing strategy, finance, and social network research and draw on interviews with investment bankers to investigate the financial impact of social capital from different types of B2B relationships—as well as the moderating role of absorptive capacity—in the context of young firms at IPO. Our work departs from and extends existing research in at least four ways. First, it enriches the B2B literature by demonstrating the contingent value of various types of B2B relationships, thus resolving the conflict in the extant findings about B2B relationships' impact on firm performance Second, previous absorptive capacity research has merely considered R&D or technological know-how We introduce and measure marketing know-how and customer know-how absorptive capacities to match specific types of B2B relationships Third, sociology studies argue that social capital can contribute to financial capital, but researchers have attempted only limited empirical testing of this expectation We provide real-world evidence for B2B network capital's financial value More important, we demonstrate that while B2B relationships provide access to resources (i e , opportunity), firms require absorptive capacity (i e , ability to leverage the resources) to deliver financial value and thus contribute to the marketing–finance interface literature Finally, our focus on start-ups adds unique insights to the entrepreneurship literature

Conceptual Framework

Social capital is "the aggregate of the actual or potential resources linked to possession of a durable network of more or less institutionalized relationships" (Bourdieu 1985, p 248) It consists of (1) the relationship itself providing access to resources possessed by the associates and (2) the nature and amount of those resources (Portes 1998) We capture the nature of the resources by classifying start-ups' B2B relationships into three types R&D alliance relationships, marketing alliance relationships, and key customer relationships In the social network literature, a node with greater centrality has access to more resources from the other nodes (Tsai and Ghoshal 1998) Thus, we employ the local (ego) centrality—that is, the number of ties a firm has in each type of its B2B networks—to capture the amount of resources (e g , Scott 2000)

To determine the financial outcome, IPO value, we follow Srivastava, Shervani, and Fahey's (1998) logic by analyzing the level (cash inflows, outflows), timing, and volatility of a young technology firm's future cash flows Table 1 summarizes the potential impact of three types of B2B relationships Figure 1 provides an overview of the conceptual framework

The Impact of R&D Alliance Relationships on IPO Value

Positive impact Research-and-development alliances involve R&D and innovating activities Technological innovations have become increasingly complex and require extensive resources (e g , Sorescu and Spanjol 2003) Social capital from R&D alliances is a critical source of resources for a young technology firm's R&D activities, which in turn influence its cash flows First, R&D alliances help enhance the level of future cash flows by reducing the cash outflows Because of great operational risks, start-ups typically face high financing costs (e g , high interest on debt, Uzzi 1999) Moreover, R&D alliance partners often provide financial resources and thus lower the financing cost for a young firm's R&D activities For example, start-up Inktomi Corporation obtained $2 million in funding from Intel under their R&D alliance agreement Research-and-development alliance partners may also provide established R&D resources (e g , laboratories, equipment), thus reducing the start-up's own R&D expenditures Moreover, such alliances are likely to reduce the young firm's R&D costs through economies of scale and scope (e g , Gomes-Casseres 1997)

Second, R&D alliances help accelerate the speed of cash flows Rich resources (including knowledge and information) brought by R&D alliance partners enable timely response to critical information (Lane and Lubatkin 1998) and help identify technological advancements and opportunities more quickly In addition, R&D partners bring about rapid prototyping, which shortens the new product development (NPD) cycle and speeds up cash flows (Thomke 1998)

Third, R&D alliances help reduce the volatility of cash flows Innovation is widely recognized as highly risky (e g , Sorescu and Spanjol 2008) Pooled technological and financial resources in R&D alliances put young firms in a better position—in a jointly developed and well-funded laboratory with many experienced scientists—to lower the risks inherent in innovation processes (Deeds and Hill 1999) The investment bankers we interviewed also echoed the R&D alliances' impact on the risk of future cash flows, suggesting that while R&D partnerships are expected for established firms, for young firms they are critical because they serve as a stamp of approval As one investment banker articulated, "[the presence of R&D alliances] shows that you are a company that can operate at that level and lowers business risk, which should enhance the multiple an investor would pay for the business "

As a young firm's number of R&D alliance relationships (or R&D alliance network centrality) increases, it is exposed to more R&D resources (Tsai and Ghoshal 1998) Richer resources enhance all three effects—reduction in cash outflows and cash flow volatilities and acceleration of cash flows—increasing the net present value of cash flows and thus the IPO value

Negative impact Joining R&D alliances may decrease start-ups' financial value First, financially constrained firms, such as start-ups, have lower negotiating power and tend to give up too much of their ownership when entering alliances This is called the risk of equity relinquishment (Aghion and Tirole 1994, Guo, Lev, and Zhou 2005), R&D alliance partners may make use of their resource advantage to behave opportunistically at the expense of the young firms Young firms are thus not likely to obtain fair gains from the value created in the alliance The investment bankers we interviewed agreed with this view, as exemplified by the following statement "If the partner can extract all the value out of the relationship, partnerships can be a detractor of value "

Moreover, R&D alliance relationships run the risk of leakage of strategically important knowledge to competitors, especially if the opportunistic partner has or builds ties with the start-up's competitors (Dutta and Weiss 1997) Such partners may also play one partner against the other (i e , the divide et impera principle) and thus appropriate gains from the relationship (Van den Bulte and Wuyts 2007) This in turn can reduce the level of cash flows and increase the volatility and vulnerability of cash flows

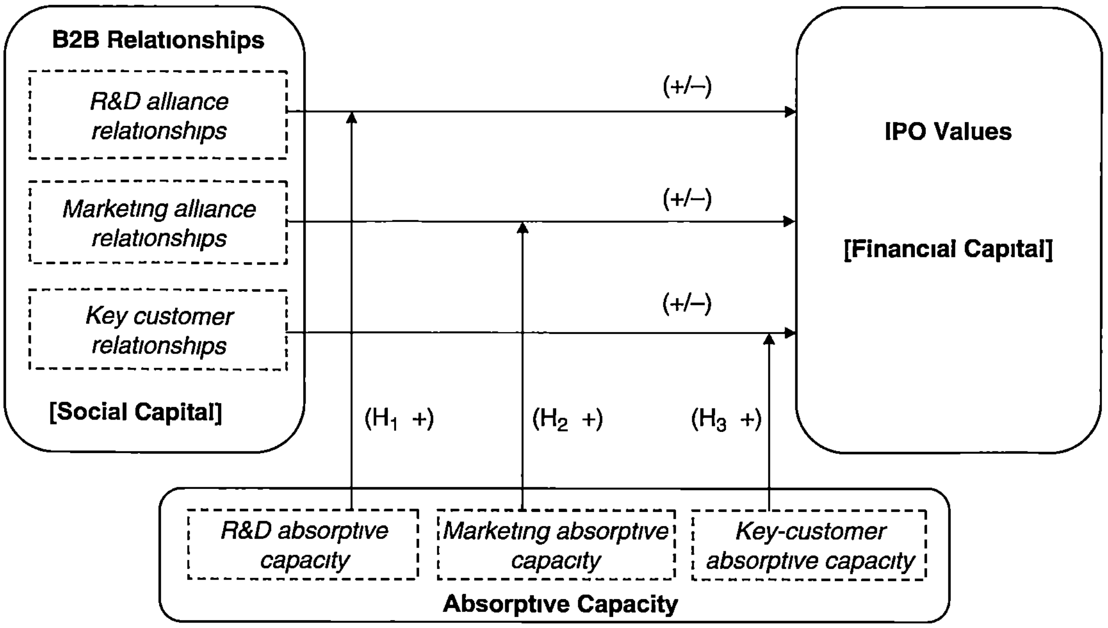
Research has found that nearly half of R&D alliances underperform (Park and Ungson 2003) One explanation is the tendency of alliance partners to reject external knowledge, a tendency labeled as the "not invented here" (NIH) syndrome (Katz and Allen 1982) This syndrome may

TABLE 1
Impact of B2B Relationships on Young Technology Firms' IPO Value

	R&D Alliance Relationships	Marketing Alliance Relationships	Key Customer Relationships
Effects on the Level of Cash Flows			
Positive impact on IPO value (increase the level of cash flows)	•[AC +] Reduce R&D costs •[AC +] Enhance R&D capabilities and future cash inflows	•[AC +] Reduce marketing and sales costs •[AC +] Enhance marketing capabilities and future cash inflows	•[AC +] Reduce the cost of goods sold •[AC +] Increase the key customers' willingness to purchase and thus enhance sales
Negative impact on IPO value (decrease the level of cash flows)	•[AC –] Increase the likelihood of equity relinquishment •[AC –] Increase the risk of leakage of strategically important knowledge to competitors	•[AC –] Increase the likelihood of equity relinquishment •[AC –] Constrain future sales growth if young firms overrely on partners' marketing capabilities	•Constrain future sales growth, as substantial relationship-specific investments reduce the amount of resources available to explore other markets and service other customers
Effects on the Speed of Cash Flows			
Positive impact on IPO value (increase the speed of cash flows)	•[AC +] Facilitate faster response to critical information (e.g., new technology development) •[AC +] Shorten NPD cycle	•Facilitate market penetration •Penetrate a larger proportion of the world markets quickly	•[AC +] Facilitate reaction to changes in key customer needs and thus enhance the speed of product development or adjustment •[AC +] Facilitate customer adoption
Negative impact on IPO value (decrease the speed of cash flows)	•[AC –] NIH syndrome may prevent speedy acceptance of external technological knowledge	•[AC –] Deter the development of young firms' own marketing capabilities if young firms overrely on alliance partners' marketing capabilities	•[AC –] Reduce the speed of converting sales revenue into cash flows because firms do not want to risk their relationships with key customers by imposing late-payment penalties
Effects on the Volatility of Cash Flows			
Positive impact on IPO value (decrease the volatility of cash flows)	•[AC +] Reduce the risks in R&D processes and the chance of R&D failures with pooled resources, thus increasing the predictability and stability of future cash flows •Provide positive signal to investors and reduce their perceived business risks	•Promote better channel coordination and operations stability •Access to partners' customer base, reducing the variability in sales •[AC +] Reduce variability in future revenues and costs as young firms develop their own marketing capabilities and assets	•Provide smooth revenue streams •[AC +] Reduce the variance in transaction costs •[AC +] Reduce the chance of being rejected for unsuitable offerings •[AC +] Reduce the variance in inventory costs (may not be as relevant to firms in the software industry)
Negative impact on IPO value (increase the volatility of cash flows)	•[AC –] Reduce the predictability of future cash flows due to the risk of equity relinquishment •[AC –] Reduce the predictability of future cash flows as the risk of know how leakage increases	•[AC –] Increase the uncertainty of long-term marketing success if the young firms overrely on alliance partners' marketing capabilities •[AC –] Increase unpredictability due to the risk of equity relinquishment	•[AC –] Increase the risks of credit concentration •[AC –] Increase the vulnerability of cash inflows when key customers switch to competitors

Notes: [AC +/–] signifies that the particular impact can be enhanced/mitigated by relevant absorptive capacity (logics are explained in the main text).

FIGURE 1
Conceptual Framework


B2B Relationships
R&D alliance relationships
Marketing alliance relationships
Key customer relationships
[Social Capital]
(+/–)
(+/–)
(+/–)
IPO Values
[Financial Capital]
(H1 +)
(H2 +)
(H3 +)
R&D absorptive capacity
Marketing absorptive capacity
Key-customer absorptive capacity
Absorptive Capacity

have a pernicious effect on the adoption speed of external knowledge from the alliance partner and thus eventually negatively affect the speed of cash flows of the firm. In summary, joining R&D alliance relationships can have both positive and negative influence on IPO value, the overall effect is unclear.

The Moderating Role of R&D Absorptive Capacity

To effectively transform social capital into financial value, a firm needs to actively deploy the B2B resources and convert them to a desired end. The resource-based view contends that a firm should develop relevant capabilities to identify and utilize resources such as external knowledge (e.g., Bharadwaj, Varadarajan, and Fahy 1993). Prior research has referred to this capability as absorptive capacity (Cohen and Levinthal 1990). Following Narasimhan, Rajiv, and Dutta (2006), we conceptualize absorptive capacity as the efficiency of a firm to absorb external know-how, compared with what it could have absorbed given the relevant resources it can access. We view it as a complementary capability but go beyond the traditional notion (Milgrom and Roberts 1995) by noting that absorptive capacity not only enhances the benefit of these B2B relationships but also mitigates the negative effects. This view is consistent with the growing sentiment that isolated resources or capabilities, however valuable, may not be effective as single assets for strategic activities (Moorman and Slotegraaf 1999). Rather, the value of these assets arises from complementarities, or the way they interact to affect performance. We label the efficiency of absorbing technological and R&D know-how as R&D absorptive capacity. Notably, R&D absorptive capacity coincides with the traditional conceptualization of absorptive capacity, which takes an R&D focus.

Strong R&D absorptive capacity facilitates interorganizational learning and enables a firm to recognize and synthesize external knowledge. The learning effects enhance the economies of scale and synergies in R&D alliances (e.g., Sampson 2007), which further increase a start-up's R&D cost efficiency (further reducing cash outflows) and decrease its risk of R&D failure (further increasing the predictability of the future cash flows). Reduction in R&D failures or iterations also further shortens the NPD cycle (further accelerates cash flows).

In B2B networks, knowledge is embedded in a social context, making it more unique, less imitable, and thus more likely to create strategic value (Spender 1996). Absorption of such tacit knowledge helps a firm build up its unique R&D capabilities, which are rare, imperfectly tradable, and costly to imitate. The tacitness makes it difficult for R&D alliance partners to pass on strategic information about the start-up to other firms, thus limiting the potential of playing one partner against another and lowering the vulnerability in future cash flows. More important, the unique R&D capabilities form the basis of competitive advantage, predicting superior future R&D performance (e.g., Bharadwaj, Varadarajan, and Fahy 1993). This not only enhances future cash inflows for the young firm but also potentially increases the total size of the pie (greater expected outcomes from the R&D alliance that are to be shared among the partners) and provides the start-up with greater negotiation power in equity discussions with its alliance partners, mitigating the risk of equity relinquishment.

A firm with strong R&D absorptive capacity is likely to develop common language and shared experiences with R&D alliance partners. This should enable the young firm to more readily accept external knowledge from R&D partners, thereby minimizing the negative effects of the NIH syndrome in alliances (Cohen and Levinthal 1990). As investors tend to seek indirect signals to assess start-ups, a firm with strong absorptive capacity can convey a positive signal to investors regarding their ability to benefit from R&D alliance relationships and alleviate investors' concerns about the potential negative effects Thus

> H_1 The positive (negative) effect of a young technology firm's R&D alliance relationships on the IPO value is enhanced (mitigated) by its R&D absorptive capacity

The Impact of Marketing Alliance Relationships on IPO Value

Positive impact Marketing alliances involve activities such as cobranding, joint marketing, and sharing of distribution channels Marketing alliance relationships can also have impact on IPO value by influencing a start-up's future cash flows First, marketing alliance relationships help decrease cash outflows as the partners' experienced marketing and sales forces reduce the start-up's marketing and selling expenditures and lower the chance of failures in product introduction and promotional campaigns (Comanor 1965)

Second, marketing alliance partners' established distribution channels facilitate market penetration (Mitchell 1989) and accelerate cash flows An investment banker pointed out that a key driver of Monster Beverage's value is its distribution partnership with Anheuser-Busch In a global market context, marketing alliances enable quicker penetration of a larger portion of the world markets simultaneously For example, an alliance with AskNet expands the software start-up InterVideo's European market presence

Third, marketing alliances can decrease the volatility of cash flows because the partners' established supply chains enhance channel coordination and promote stability in operations In addition, marketing alliances entail access to the partners' existing relationships with customers or retailers (Swaminathan and Moorman 2009) For example, Kana Communications was allowed access to the user base of its partner NISUS, similarly, BottomLine gained access to PeopleSoft's customers upon alliance formation Access to loyal customer bases is valuable because revenues from such customers are less susceptible to competition (Tuli, Bharadwaj, and Kohli 2010)

Negative impact Despite the previously mentioned three benefits, marketing alliances also expose young firms to greater risks of equity relinquishment Most marketing alliance partners are established firms and are likely to seek ownership of the products Because of financial constraints, young firms may concede too much of the ownership when joining marketing alliances (Aghion and Tirole 1994) Here, a disproportionate share of the value created is appropriated by the established alliance partners rather than the young firms themselves, therefore negatively influencing investors' assessment of young firms' value The situation can be worsened by the danger of dependence (Miles, Preece, and Baetz 1999), that is, when young technology firms overrely on their partners' marketing capabilities Such firms can expect limited future growth potential, delayed development of their own marketing capabilities, and increased uncertainty in their future marketing success after marketing alliances terminate (thus decreasing the expected level and speed of future cash flows and increasing the expected volatility of future cash flows) As one of the investment bankers pointed out, "development of a unique marketing capability obviously has more value for a company than if it is dependent on someone else to market their offerings alone" Thus, marketing alliance relationships can also lower IPO value

The Moderating Role of Marketing Absorptive Capacity

Previous literature has discussed absorptive capacity almost exclusively in terms of absorbing R&D or technological know-how We conceptualize the efficiency with which a firm absorbs marketing know-how relative to what it could have absorbed given the marketing resources it deploys, as marketing absorptive capacity

A young firm with strong marketing absorptive capacity is more likely to grow marketing knowledge and enhance its own marketing capabilities through the transfer of knowledge in its alliance network With their own marketing capabilities developed, a firm is less likely to overrely on its partners' brands, channels, and marketing support and be subject to the "danger of dependence" (which influences level, speed, and volatility of cash flows, as mentioned previously) As an investment banker concluded, "Having your own marketing capability typically means you can capture more economics of a transaction" Capabilities built on tacit knowledge are unique and less imitable They lead to competitive advantage and promote future marketing success, predicting greater and less volatile cash inflows Moreover, a young firm with strong marketing absorptive capacity may create more value out of the alliance cooperation, and thus, holding share of the value constant, the alliance partner may get a larger amount of benefit This ability may provide the young firm with a better bargaining position and reduce its likelihood of conceding a disproportionate share of equity to the alliance partner In summary, absorptive capacity facilitates the development of marketing capabilities, alleviates the danger of dependence, and minimizes the potential risk of equity relinquishment Formally,

> H_2 The positive (or negative) effect of a young technology firm's marketing alliance relationships on the IPO value is enhanced (or mitigated) by its marketing absorptive capacity

The Impact of Key Customer Relationships on IPO Value

Positive impact Key customer relationships are a firm's relationships with its business customers that contribute a significant portion of its sales Social capital from key customer relationships helps decrease cash outflows as the growing mutual understanding, trust, and solidarity in key customer relationships reduce transaction costs such as cost of contracting (e g , Ganesan 1994) Firms with more key customer relationships are also likely to have more effective inventory and distribution management than firms with high customer turnover (e g , Kalwani and Narayandas 1995),[2] leading to reduction in inventory and distribution costs and thus lower cash outflows

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[2] Although our arguments on inventory/distribution costs hold for most young technology firms, including those in the computer industry, they may not be as relevant to the software industry

Key customer relationships also help accelerate cash flows The solidarity and trust in these relationships tend to provide early access to private information on customer needs (Tuli, Bharadwaj, and Kohli 2010) This enables the young firm to quickly detect and react to the changes in customer needs, thus reducing the NPD cycle Key customer relationships also enable a richer understanding of the customers' operational and political environment, which increases the likelihood and speed of customer adoption (Tuli, Kohli, and Bharadwaj 2007)

Young firms' cash flow volatilities can also be lowered when they possess key customer relationships These customers may provide smoother revenue streams (e g , Tuli, Bharadwaj, and Kohli 2010) and, thus, more stable cash flows In addition, as a firm gains experience working with a customer, its better understanding of customer needs reduces the risks of being rejected for unsuitable offerings Moreover, as a young firm becomes familiar with key customers' demand patterns, it can anticipate and make appropriate adjustments to its manufacturing cycle (Kalwani and Narayandas 1995) This capability to adjust production cycles can reduce the instances of high customer order demand coinciding with low firm inventory levels and vice versa (Bharadwaj, Varadarajan, and Fahy 2007), thus decreasing the variability of inventory costs In line with the logic of key customer relationships' reducing the variance of cash flows, an investment banker opined that if a start-up has an established relationship with a customer, "you should apply a lower discount rate to these cash flows given that there is more certainty"

Negative impact Developing key customer relationships often requires substantial relationship-specific investments that may have little or no value outside the relationship (e g , Heide and John 1990) This can limit the supplier firm's resources available to service other customers or explore other markets, thus placing constraint on the firm's sales growth or cash inflows For example, Miles and Snow (1992) suggest that the focus on servicing a small number of customers could make a supplier less competitive in other markets Similarly, others find that a tight coupling with customers could restrict the vision of the firm and hurt its competitiveness in the long run (Danneels 2003) The speed of converting sales revenue into cash flows can also be slowed down by key customer relationships because many young firms do not want to risk their relationships with key customers by imposing severe late-payment penalties (e g , Summers and Wilson 2003)

Because key customers contribute a significant proportion of a firm's sales, the risks of credit concentration might raise investors' concerns about the firm's ability to collect future cash inflows (e g , Pike and Cheng 2001) Significant customers can also pose a threat to a start-up's survival and stability of its cash flows if they ever switch As an investment banker observed, "Relationships with customers are important, particularly if you have any customer concentration, which can act as a red flag to the investors that you are susceptible to losing a big chunk of your business or that they have negotiating power over you when it is time to renegotiate price, etc" In summary, the impact of key customer relationships on IPO value is inconclusive, with both the positive effects and negative effects considered

The Moderating Role of Key-Customer Absorptive Capacity

"Key-customer absorptive capacity" refers to the efficiency with which a firm absorbs know-how about its key customers relative to what it could have absorbed given the key customer relationship resources it accesses Strong absorptive capacity enhances the supplier firm's understanding of customer needs and thus enables the firm to develop products that provide a better fit than its competitors (Hoch and Deighton 1989) This facilitates the development of the young firm's competitive advantage and increases customers' dependence on the firm, resulting in the customers' willingness to purchase a broader array of products, which in turn increases the relationship scope and sales (Kalwani and Narayandas 1995) Thus, the impact of key customer relationships on the level of cash inflows is further enhanced as absorptive capacity increases Key-customer absorptive capacity also enhances the effect of learning and relationship-specific economies of scale (Johnson and Selnes 2004), which reduce unit costs and thus further lower the level of cash outflows

As customers' dependence on the supplier firm increases, they have a greater motivation to maintain the ongoing relationships This could mitigate the risk of customer switching (thus decreasing the volatility of future cash flows) and help reduce accounts receivables (thus accelerating the speed of converting sales revenue into cash flows and minimizing credit risks) The growing mutual dependence between the firm and its key customers can enable access to more private information, which helps the suppler firm make more effective manufacturing adjustments that lead to even lower variance in the cost of goods sold Better and deeper customer knowledge brought about by strong absorptive capacity also further enhances product development speed and customer adoption rate, thus speeding up cash flows In summary, absorptive capacity reinforces the positive effects and minimizes the negative effects of key customer relationships on the level, speed, and volatility of cash flows Therefore,

H_3 The positive (or negative) effect of a young technology firm's key customer relationships on the IPO value is enhanced (or mitigated) by its key-customer absorptive capacity

Data

We combined several secondary data sources in this study We obtained a list of first-time-IPO firms in the computer (standard industrial classification [SIC] 357) and software (SIC 7371 and 7372) industries from 1996 through 2006 from Thomson Financial Global New Issue Database—excluding those whose IPO prospectuses could not be located Then, we searched for and confirmed pre-IPO information about alliance type, alliance partners, and key customers for each company from SDC Platinum, IPO prospectus, Securities and Exchange Commission (SEC) 10-K filings, and FACTIVA We used the databases of the National Bureau of Economic Research and the United States Patent and Trademark Office for patent, patent citation, and trademark data We collected IPO value, venture capital involvement, upper-echelon information, and accounting data from multiple sources, including IPO prospectuses, Thomson Financial, the Center for Research in Security Prices, COMPUSTAT, and SEC 10-K filings We found the number of selling and marketing employees from the "Employees" sections in IPO prospectuses and SEC 10-K filings We obtained a final sample of 177 IPO firms, including 70 firms in the computer industry and 107 firms in the software industry, with an average age at IPO of 7 7 years In addition to these IPO firms, we obtained information from Standard & Poor's NetAdvantage on 116 private companies in the computer and software sector that were founded in the same period as our sample but did not offer an IPO

Measures

Dependent variable IPO value We employ four alternate measures for IPO value (IPOV) First, following Guo, Lev, and Zhou (2005), we calculated the initial offer value by multiplying the initial offer price (midpoint of the expected offer price range established by the underwriters filed with SEC) by the expected number of shares outstanding after IPO Second, we obtained from the front page of the IPO prospectus the total price to public (i e , the product of price per share and number of shares to be offered) Third, because the finance literature has noted the common phenomenon of underpricing in IPO, we employ the firms' market value at the end of the first trading day and at the end of the 90th day after IPO (calculated by multiplying the closing price with the number of shares outstanding on the relevant day) for robustness checks

R&D alliance relationships The R&D alliance relationships variable (RAR) is a count of a young firm's partners in the active R&D alliances in which it participated before its IPO date In other words, we use the absolute local centrality measure (the number of links incident on an actor) to capture the amount of social capital, the same as the ego degree centrality in an ego network of R&D alliance relationships, with the young technology firm as the ego (e g , Everett and Borgatti 2005, Freeman 1982)

Marketing alliance relationships The marketing alliance relationships variable (MAR) is a count of a firm's unique partners in the active alliances involving marketing activities in which the firm participated before its IPO date These counts include, for example, cobranding alliances, joint-marketing alliances, channel-sharing alliances, and product-integration alliances

Key customer relationships The key customer relationships variable (KCR) is a count of significant customers from which a firm has generated revenues for two consecutive years or longer[3] To be considered a key customer relationship, a relationship must not be reported as terminated in the IPO prospectus

Absorptive capacity Absorptive capacity is the efficiency of absorbing know-how, given the amount of resources available The production frontier model in economics (e g , Silberberg 1990) states that the maximal amount of know-how absorbable for firm i can be written as a function of the resources the firm accesses (Narasimhan, Rajiv, and Dutta 2006)

$$y_{Mi} = f(X_i \; \text{Resources}_i, \alpha), \tag{M1}$$

where

y_M = the maximal amount of know-how absorbable,
X = a vector of resource inputs, and
α = a vector of parameters for the resources

On the basis of the literature, we classify the factors that influence the maximal amount of know-how absorbable (i e , X variables) into three categories internal resources, external resources, and market conditions Specific variables in each category can vary for different types of know-how absorbable (We present the detailed model specification for each type of know-how next) However, firms often cannot reach the maximal level in the frontier One reason is the random shocks, such as luck and other random factors out of a firm's control The other reason is the inefficiency of a firm in absorbing know-how

To put it formally, the amount of know-how firm i actually absorbs is

$$y_{Ai} = f(X_i \; \text{Resources}_i, \alpha) \times \exp(\varepsilon_i) \times \exp(-\eta_i), \tag{M2}$$

where

y_A = the actual amount of know-how absorbed,
ε = is the random shock, and
η = the inefficiency of absorbing know-how, $\eta \geq 0$

Because absorptive capacity is the efficiency of absorbing know-how, we can derive absorptive capacity measures using the estimation of the inefficiency term η_i

R&D absorptive capacity To determine the R&D absorptive capacity (RD_AC), we take the natural logarithm on both sides of Equation M2, for firm i in each year t ($t = 1, \quad , T_i$) during the past T_i fiscal years before IPO

$$\begin{aligned} \ln(\text{RDKA}_{it}) = {} & \alpha_0 + \alpha_1 \ln(\text{XRD}_{it}) + \alpha_2 \ln(\text{XRD}_{it-1}) \\ & + \alpha_3 \ln(\text{INVS}_{it}) + \alpha_4 \ln(\text{RAR}_{it}) \\ & + \alpha_5 \text{MC}_i + \alpha_6 \ln(\text{RDKA}_{it-1}) + \varepsilon_{it} - \eta_{it}, \end{aligned} \tag{M3}$$

where

RDKA_{it} = R&D know-how absorbed (following Narasimhan, Rajiv, and Dutta [2006], RDKA is measured as the number of patent classes drawn by a firm that do not overlap with the firm's original domain of expertise, that is, the collection of total classes of patents it owns) by firm i in year t,
XRD_{it} = R&D expenditure of firm i in year t,

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[3] Companies report "major customers" or "customer concentration" (e g , individual customers that contribute to 10% or more of the firm's annual revenues in the past years) in their IPO prospectus and statements of income Companies also report the termination of major selling contracts or customer relationships in their SEC filings We also searched the companies around their IPO dates in FACTIVA to check for news about the termination of customer relationships We include only active and current relationships because only these are likely to affect future cash flows and the impact of terminated relationships has already been fully reflected in financial outcomes (e g , cash flows from operations, return on assets), which we control for in the model

$INVS_{it}$ = innovation stock (citation-weighted patent count) of firm i in year t,
RAR_{it} = count of R&D alliance partners of firm i in year t, and
MC_i = market conditions (dummy variables based on the four-digit SIC code of firm i).

The X variables on the right-hand side (RHS) of Equation M3 capture the three aforementioned categories of factors that influence the maximal amount of R&D know-how absorbable. Specifically, according to Cohen and Levinthal (1990), firms with the two types of internal resources, R&D expenditures and technological expertise (measured by innovation stock), should be able to absorb more R&D know-how.[4] We use the count of R&D alliance partners to capture the external R&D resources accessible (Deeds and Hill 1999). In addition, we include dummy variables to control for industry/market conditions (Narasimhan, Rajiv, and Dutta 2006). Existing economics studies suggest the importance of lagged dependent variable in explaining R&D productivity (e.g., Hall, Griliches, and Hausman 1986), therefore, we include lagged RDKA on the RHS to account for the possible momentum in absorbing R&D know-how.

We assume that $\varepsilon_i \sim N(0, \sigma_\varepsilon^2)$, $\eta_i \sim N(\mu, \sigma_\eta^2)$, with $\mu > 0$, $E[\varepsilon_{it}\eta_{it}] = 0$, and that the two error components are independently distributed of the independent variables in Equation M3, and following Narasimhan, Rajiv, and Dutta (2006), we estimate R&D absorptive capacity using the stochastic frontier estimations (SFE) method. The maximum likelihood estimates of the parameters μ, σ_ε, and σ_η (mean of η_i, standard variance of ε_i and η_i) are first derived following Battese and Coelli (1992). Consistent estimate for the inefficiency term η_i can then be obtained from the mean of the conditional distribution $f(\eta \mid \xi)$.[5] Finally, we rescale the estimation of η_i to be between 0 and 100 and measure R&D absorptive capacity as $100 - \eta_i^*$ (the higher the inefficiency, the lower the absorptive capacity).

Marketing absorptive capacity. We use the same input–output model structure specified in Equation M3 to estimate a firm's (in)efficiency in absorbing marketing know-how (MK_AC). Analogous to the R&D know-how measure, we capture the amount of marketing know-how absorbed by counting the classes of the trademarks filed by a firm that do not overlap with the firm's area of expertise (measured by the classes of registered trademarks the firm owns). Consistent with the specification in the R&D frontier, the internal resources consist of not only selling and marketing expenditures but also marketing expertise (measured by trademark class stock), because a large body of absorptive capacity literature suggests that prior related knowledge plays an important role in absorbing new knowledge (e.g., Lane, Koka, and Pathak 2006). We use the number of marketing alliance partners to capture the external resources accessible and industry dummy variables to capture market conditions. Consistent with the R&D SFE in Equation M3, we include the lagged output on the RHS to capture the possible momentum in know-how absorption. For firm i in year t,

$$\text{(M4)}\quad \begin{aligned} \ln(MKKA_{it}) &= \alpha_0 + \alpha_1 \ln(XSM_{it}) + \alpha_2 \ln(XSM_{it-1}) \\ &\quad + \alpha_3 \ln(TMCS_{it}) + \alpha_4 \ln(MAR_{it}) \\ &\quad + \alpha_5 \ln(MC_i) + \alpha_6 \ln(MKKA_{it-1}) + \varepsilon_{it} - \eta_{it}, \end{aligned}$$

where

$MKKA_{it}$ = marketing know-how absorbed by firm i in year t,
XSM_{it} = selling and marketing expenditure by firm i in year t,
$TMCS_{it}$ = trademark class stock (count of the classes of registered trademarks) of firm i in year t,
MAR_{it} = count of marketing alliance partners of firm i in year t, and
MC_i = market conditions (dummy variables based on the four-digit SIC code of firm i).

Then we estimate and rescale η_i^* following the same approach done previously, and marketing absorptive capacity can be measured as $100 - \eta_i^*$.

Key-customer absorptive capacity. The know-how absorption process includes not only the identification and acquisition of know-how but also applying the acquired know-how to commercial end (Cohen and Levinthal 1990). The operationalizations of the outputs in the R&D know-how SFE (Equation M3) and marketing know-how SFE (Equation M4) reflected this logic, using new patent classes and new trademark classes, respectively, to capture the desired commercial outcomes. Because revenue generation is the major goal of customer relationship management, we employed the sales revenue generated from the key customers to reflect the amount of know-how absorbed (identified, acquired, and utilized) from the key customers. For firm i in year t with K_i key customers k ($k = 1, 2, \ldots, K_i$),

$$\text{(M5)}\quad \begin{aligned} \ln\left(\sum_{k=1}^{K_i} REV_{i,k,t}\right) &= \alpha_0 + \alpha_1 \ln(SMEMP_{it}) + \alpha_2 \ln(REC_{i,t}) \\ &\quad + \alpha_3 \ln(PAT\_S_{it}) + \alpha_4 \ln(K_i) + \alpha_5 MC_i \\ &\quad + \alpha_6 \ln\left(\sum_{k=1}^{K_i} REV_{i,k,t-1}\right) + \varepsilon_{it} - \eta_{it}, \end{aligned}$$

where

$REV_{i,k,t}$ = firm i's sales revenue generated from customer k in year t,
$SMEMP_{it}$ = firm i's number of selling and marketing employees,
$REC_{i,k,t}$ = firm i's account receivables to customer k in year t,
PAT_S_{it} = patent stock (count of the patents owned) of firm i in year t, and
MC_i = market conditions (dummy variables based on the four-digit SIC code of firm i.

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[4] We include R&D expenditures from both the corresponding year and the previous year on the RHS because the literature indicates the common existence of time lag between R&D expenditures and patent outcomes (e.g., Blundell, Griffith, and Windmeijer 2002). We thank an anonymous *JM* reviewer for pointing this out.

[5] $\xi_{it} = \ln(RDKA_{it}) - [\alpha_0 + \alpha_1 \ln(XRD_{it}) + \alpha_2 \ln(XRD_{it-1}) + \alpha_3 \ln(INVS_{it}) + \alpha_4 \ln(RAR_{it}) + \alpha_5 MC_i + \alpha_6 \ln(RDKA_{it-1})]$, $E(\eta_i \mid \xi_{it}) = M_i + D_i\{[\varphi(-M_i/D_i)]/[1 - \Phi(-M_i/D_i)]\}$, where $M_i = (\mu\sigma_\varepsilon^2 - \sum_{t=1}^{T_i} \xi_{it}\sigma_\eta^2)/(\sigma_\varepsilon^2 + \sum_{t=1}^{T_i} \sigma_\eta^2)$, and $D_i = (\sigma_\varepsilon^2\sigma_\eta^2)/(\sigma_\varepsilon^2 + \sum_{t=1}^{T_i} \sigma_\eta^2)$.

We include three variables to represent the internal resources selling and marketing employees, accounts receivables, and technology stock As highlighted in the relationship marketing literature, interpersonal relationships play a vital role in B2B selling (e g , Abdul-Muhmin 2005) Thus, we include selling and marketing employees as an important internal resource Doing so avoids the risk of double-counting selling and marketing expenditures (already included in Equation M4) We expect that accounts receivables can enhance sales to key customers because they can be viewed as a firm's investment in the customer relationship (interest-free loans to customers, e g , Dutta, Narasimhan, and Rajiv 1999) Dutta, Narasimhan, and Rajiv (1999) also suggest that technology stock can be another important internal resource that increases sales because it helps convince the key customers about the firm's technological advantage and better retain the customers with updated new products We use the number of key customers to capture the level of external resources and industry dummies to control for market conditions Consistent with Equations M3 and M4, we add a lagged dependent variable to the RHS to control for the potential momentum effect After we estimate and rescale η_{it}^* following the aforementioned approach, we can measure key-customer absorptive capacity as $100-\eta_{it}^*$

Control variables Finance and management studies have demonstrated that venture capital involvement signals issue quality and leads to favorable valuation of a firm, thus influencing IPO performance (e g , Ritter and Welch 2002) Therefore, our first control variable (Q) is for the effect of venture capital investment in the firm Second, the finance literature has also considered underwriter reputation as a signal of new issue's quality Therefore, we adopted the Carter–Manaster underwriter ranking to control for this effect (see, e g , Carter and Manaster 1990) Third, we control for the experience of the upper echelon, (i e , top managers and directors, e g , Cohen and Dean 2005) We measured the upper-echelon experience by the average managerial and board positions a firm's upper echelons had before joining the current firm Fourth, IPO markets may fluctuate with macroeconomic cycles and dynamics Therefore, we include IPO year dummies to control for the financial market conditions at the time a firm initiates its IPO We also use an industry dummy (0 for computer and 1 for software) to control for the industry effect Finally, we control for firm age at IPO and accounting information, including cash flows from operations, return on asset, R&D expenditures, and selling and marketing expenditures of the last fiscal year before the IPO

Model and Estimation Procedure

The basic regression equation (including the interaction effects) explaining the IPO value of firm i is

$$
\begin{aligned}
(1)\quad \ln(\mathrm{IPOV}_i) = {} & \beta_0+\beta_1\times\ln(\mathrm{RAR}_i)+\beta_2\times\ln(\mathrm{MAR}_i)\\
& +\beta_3\times\ln(\mathrm{KCR}_i)+\beta_4\times\mathrm{RD\_AC}_i\\
& +\beta_5\times\mathrm{MK\_AC}_i+\beta_6\times\mathrm{C\_AC}_i\\
& +\beta_7\times\ln(\mathrm{RAR}_i)\times\mathrm{RD\_AC}_i\\
& +\beta_8\times\ln(\mathrm{MAR}_i)\times\mathrm{MK\_AC}_i\\
& +\beta_9\times\ln(\mathrm{KCR}_i)\times\mathrm{KC\_AC}_i+\beta_Q'\times Q_i+e_i
\end{aligned}
$$

However, firms self-select whether to go public or stay private (e g , Pagano, Panetta, and Zingales 1998), and IPO value is only observable for firms that do go public[6] Following Shaver (1998), we control for the self-selection bias with the two-stage estimation approach Heckman (1979) suggests A firm's choice to go public (i e , IPO value is observed, or $\mathrm{IPO}_i = 1$) can be explained as a function of firm attributes and industry conditions—that is,

$$(2)\qquad \mathrm{IPO}_i^* = \gamma'W_i+u_i,\quad \text{and}\quad \mathrm{IPO}_i = 1 \text{ if } \mathrm{IPO}_i^* > 0$$

Following Ritter and Welch (2002), Pagano, Panetta, and Zingales (1998), and Gulati and Higgins (2003), we include the number of employees (to reflect firm size), revenue, geographical location, industry, and year of foundation in the W_i vector to explain the likelihood of initiating an IPO We then compute the inverse Mills Ratio $\lambda = \varphi(\gamma'W_i)/\Phi(\gamma'W_i)$ derived from the probit specification in Equation 2 (φ and Φ are, respectively, the probability density function and cumulative density function of normal distribution) and add it to the RHS of Equation 1 to control for the selection bias and derive unbiased estimates of β'

Results

Table 2 provides the descriptive statistics and the correlation matrix of the variables in the Heckman second-stage model Although the difference between the initial offer value and total price to public indicates that original shareholders typically retain a large proportion of shares outstanding on IPO (e g , Busaba, Benveniste, and Guo 2001), these two measures are highly correlated (81) In line with the convention of IPO studies (Guo, Lev, and Zhou 2005), we scale the values by total assets to address skewness and control for heteroskedasticity because other possible deflators such as sales, book value of equity, and earnings often take negative or zero values for young firms Research-and-development absorptive capacity, marketing absorptive capacity, and key-customer absorptive capacity are derived from stochastic frontier estimations as specified

Table 3 reports the estimates of β' in Equation 1 after controlling for the potential self-selection bias In the main-effect model (Model 1), the estimated coefficients of R&D and marketing alliance relationships are not significant This suggests that social capital from alliance networks may not directly lead to high IPO value However, the coefficient of key customer relationships is positive and significant ($\beta_3 = 53, p < 01$) Therefore, we conclude that despite the potential dark side, key customer relationships can be beneficial to young firms' market capitalization

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[6] The B2B network centrality variables used in the main model are different from those in the SFE equations (M3, M4, and M5) In the SFE models, these variables are used as longitudinal data recorded for each fiscal year before the IPO over time In the main model, these variables are the counts of relationship partners at one time point before the IPO Therefore, this operation is not likely to cause multicollinearity or double-counting issues We conducted a robustness check by excluding the B2B relationship variables from SFEs, and the results remain robust

TABLE 2
Descriptive Statistics and Correlation Matrix

	Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Initial offer value	278 31	330 78															
2	Total price to public	78 13	137 19	**81**														
3	R&D alliance relationships	71	2 12	−05	−06													
4	Marketing alliance relationships	84	2 02	07	13	**64**												
5	Key customer relationships	3 14	4 54	02	−02	00	05											
6	R&D expenditures	11 75	61 02	**37**	**53**	**22**	**16**	−06										
7	Selling and marketing expenditures	22 46	96 86	**46**	**63**	05	**26**	13	**53**									
8	Assets	38 27	70 22	**52**	**58**	06	11	12	**62**	**67**								
9	Venture capital investment	25 40	41 73	**33**	**30**	−06	−07	06	**67**	**60**	**29**							
10	Return on assets	−19	57	08	06	−08	05	04	−06	**19**	**16**	−12						
11	Cash flow from operations	3 94	43 85	**53**	**52**	−11	04	**17**	−35	**37**	14	**44**	**33**					
12	Underwriter Ranking	7 61	2 48	11	13	03	01	04	07	07	02	**21**	−12	−01				
13	Upper-echelon experience	2 75	1 38	04	04	02	05	13	**19**	10	−05	**29**	−12	00	**21**			
14	R&D absorptive capacity	28 11	29 64	−08	−09	02	08	03	−14	−**22**	−13	−02	−**18**	−15	06	02		
15	Marketing absorptive capacity	42 62	29 36	−01	12	−02	03	03	−00	05	11	08	−02	07	−09	−14	15	
16	Key-customer absorptive capacity	56 12	26 67	**19**	**33**	00	12	−06	−07	10	**35**	−09	13	**21**	−02	−08	09	11

Notes Variables 1, 2, 6, 7, 8, 9, and 11 are in millions of U S dollars Correlations that are statistically significant at 5% level are in bold R&D absorptive capacity, marketing absorptive capacity, and key-customer absorptive capacity are derived from the SFE method The value of variables reported in this table is the original value Variables 1–7, 9, and 11 are scaled by assets (Variable 8) when used in model estimations

Model 2 includes the moderating effects of absorptive capacity hypothesized in H_1, H_2, and H_3 The model fit is significantly enhanced after including the three interaction factors (R^2 increases from 45 38% to 48 42%, F-test of the change in R^2 F(3, 148) = 2 91, $p \leq$ 05) In support of H_1, the estimated interaction effect between R&D alliance relationships and R&D absorptive capacity is positive and significant (β_7 = 1 19, $p <$ 05) The moderating effect of marketing absorptive capacity on marketing alliance relationships is also positive and significant (β_8 = 09, $p <$ 05), in support of H_2 These indicate that young firms need strong absorptive capacity to transform the social capital from R&D and marketing alliance relationships into IPO value However, although the interaction between key customer relationships and absorptive capacity exhibits a positive coefficient, the impact on firms' initial offer values is not significant

Employing the Johnson–Neyman technique (see Hayes and Matthes 2009), we plotted the three interaction effects in Figure 2 The technique enables us to identify the statistical significance of the impact of each type of B2B relationships on IPO value at a given level of absorptive capacity As we show in Figure 2, Panels A and B, R&D and marketing alliance relationships can enhance IPO value for firms with high levels of relevant absorptive capacity (one standard error above the mean) In contrast, if firms have low absorptive capacity (one standard error below the mean), the impact is negative and significant This means that R&D and marketing alliance relationships can potentially harm IPO value if firms lack absorptive capacity (Recall that Table 1 provides the rationale of this negative impact, as well as how absorptive capacity moderates this impact) According to Figure 2, Panel C, key customer relationships seem to significantly benefit young firms' market capitalization, and the positive effect holds (though the statistical significance decreases) even for firms with relatively low absorptive capacity

Consistent with the finance literature (e g , Barry et al 1990), we find support for the positive impact of venture capital involvement and underwriter ranking The coefficient of the inverse Mills ratio λ is not significant The positive coefficients of 1999 and 2000 dummies might be attributable to the dot-com bubble peaking in approximately 1999–2000

Robustness Check

Our model and hypotheses were based on good theoretical pedigree However, to confirm the robustness of our results, we employed alternative measures and an alternative model

Alternative measures First, we reran the model with alternative IPO value measures—namely, total price to public, market value at the end of first trading day, and the 90th day after IPO as the dependent variable The first three columns of Table 4 report the results Second, we replaced the absolute degree centrality with weighted

TABLE 3
The Effects of Three Types of B2B Relationships, Three Types of Absorptive Capacity, and Their Interactions on IPO Value

		IPO Value Measure: Initial Offer Value	
	Hypotheses	Heckman Two-Stage Model 1	Heckman Two-Stage Model 2
R&D alliance relationships (RAR)		– 40	– 41
Marketing alliance relationships (MAR)		30	05
Key-customer relationships (KCR)		53***	60***
R&D absorptive capacity (RD_AC)		06*	05*
Marketing absorptive capacity (MK_AC)		03*	06*
Key-customer absorptive capacity (KC_AC)		09	11
RAR × RD_AC	$H_1(+)$		**1 19****
MAR × MK_AC	$H_2(+)$		**09****
KCR × KC_AC	$H_3(+)$		**03**
Industry dummy		– 06	– 05
Lambda (inverse Mills ratio)		00	10
Firm age at IPO		– 00	02
Cash flows from operations		55*	43*
Return on assets		– 58	– 40
R&D expenditures		05	13
Selling and marketing expenditures		44*	43*
Venture capital involvement		02*	02*
Underwriter ranking		63**	71**
Upper-echelon experience		05	06
1997		21	22
1998		11	11
1999		71***	72**
2000		45*	47
2001		–1 60**	–1 60**
2002		03	– 17
2003		– 13	– 21
2004		46	36
2005		19	11
2006		– 32	– 42
		R^2 = 45 38%	R^2 = 48 42%

*Significant at the 10% level (two-tailed, one-tailed for interaction terms)
**Significant at the 5% level
***Significant at the 1% level

Notes Model 1 is the main effect model, while Model 2 includes interaction effects, as specified in Equation 1 Entries are coefficients We calculated bootstrapped standard errors to cope with the potential "estimated regressor problem" because estimated quantities (absorptive capacity variables) are used as independent variables (for more details, see Wooldridge 2002)

(by the size of B2B relationship partners[7]) centrality to address the concern that partners of different sizes may contribute asymmetric amount of social capital The results (reported in the fourth column in Table 4) are consistent with Table 3 Third, we reestimated marketing know-how absorptive capacity with sales revenue (instead of new trademark classes) as the output variable in SFE Accordingly, the input variables include current and lagged marketing and selling expenditures and number of trademarks (internal resources), number of marketing alliance partners (external resources), market conditions, and lagged sales revenue The fifth column of Table 4 reports the coefficients of the model using this estimate Fourth, because previous literature has not always considered the momentum of generating patents (e g , Narasimhan, Rajiv, and Dutta 2006), we reran the R&D SFE by excluding the lagged R&D know-how absorbed The results (sixth column of Table 4) using the new estimates of R&D absorptive capacity remain consistent Fifth, we include three lags (t – 1, t – 2, and t – 3) of R&D and marketing and selling expenditures in Equations M3 and M4 and reestimate R&D and marketing absorptive capacities The seventh column of Table 4 reports the results using these alternative estimates are reported in Overall, the results are robust across different measures of the key constructs

Alternative selection model Firms may self-select to form B2B relationships, and better firms might be more likely to attract B2B partners To control for this potential self-selection bias, we first conducted a probit regression to explain the likelihood for sample firms to form B2B rela-

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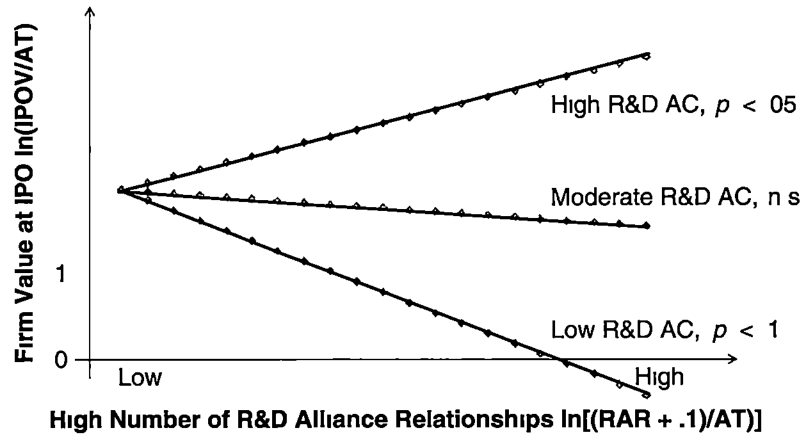
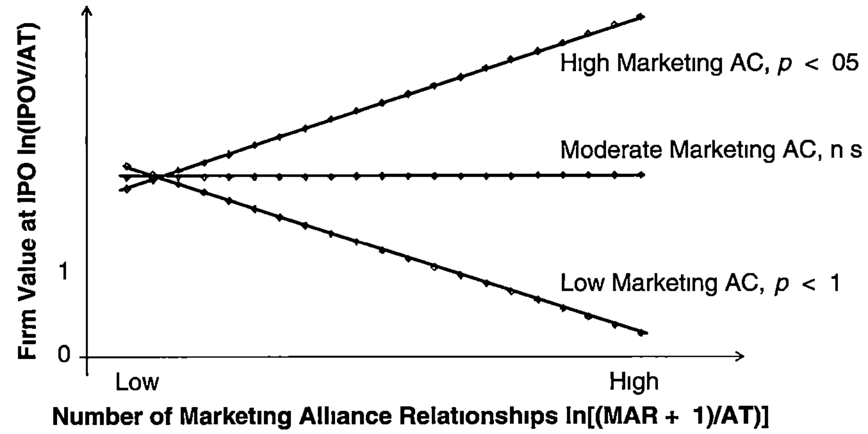
[7] Weighted-B2B-Relationships$_{i=1}$ = ($\sum_{j=1}^{J_i}$ Weight$_{i,j}$)/{[$\sum_{i=1}^{I}$ ($\sum_{j=1}^{J_i}$ Weight$_{i,j}$)]/($\sum_{i=1}^{I}$ J$_i$)}, where i = 1, 2, , I, and I = 177 is the number of sample firms, j = 1, 2, , J$_i$, and J$_i$ is the number of firm$_i$'s B2B (R&D alliance, marketing alliance, or key customer relationship) partners, Weight$_{i,j}$ is the R&D expenditure of firm i's R&D alliance partner j, or the selling and marketing expenditure of firm i's Marketing alliance partner j, or the percentage of firm i's sale to its key customer j per the firm's total sale

FIGURE 2
Johnson–Neyman Plots of the Interaction Effects

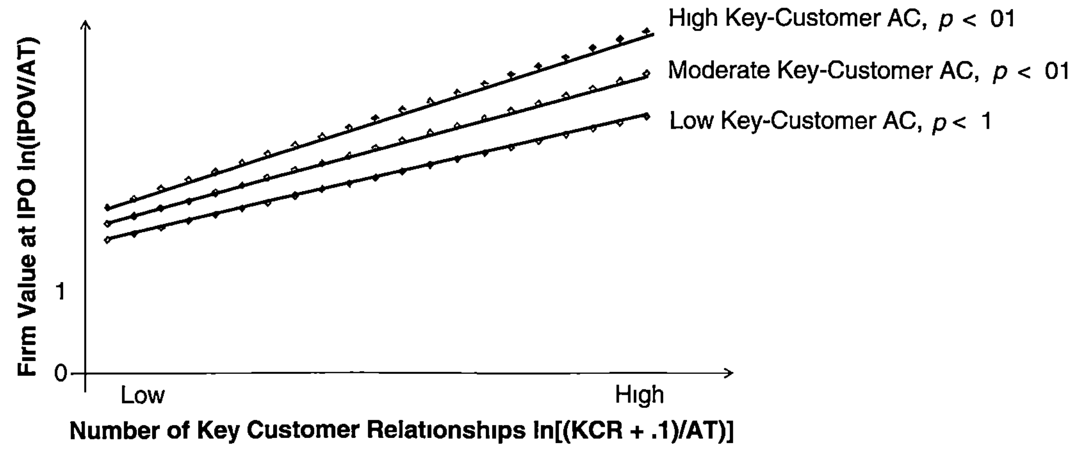
A The Interaction Effect Between R&D Alliance Relationships and R&D Absorptive



B· The Interaction Effect Between Marketing Alliance Relationshipsand Marketing Absorptive Capacity (AC)



C: The Interaction Effect Between Key-Customer Relationships and Key-Customer Absorptive Capacity (AC)



Notes n s = not significant

TABLE 4
Robustness Check

	Robustness Check with Alternative Measures							Robustness Check with Alternative Modeling Approach
	Alternative Measure for Dependent Variable			Alternative Measures for Independent Variables				
	Total Price to Public	End-of-1st-Day Value	90th-Day Value	Weighted B2B Network Centrality	Alternative Marketing Absorptive Capacity Estimate	Alternative R&D Absorptive Capacity Estimate	Alternative Absorptive Capacity Estimates	Heckman Two-Stage Model (First Stage Controlling for Self-Selection of B2B Relationship Formation)
R&D alliance relationships (RAR)	–.15	–.62	–1.35	.24	–.18	.19	.16	–.26
Marketing alliance relationships (MAR)	.13*	.78	–.12	.19*	.35	.03	.13	.17*
Key-customer relationships (KCR)	.26**	1.42*	.01	.60***	.47**	.61***	.64***	.58***
R&D absorptive capacity (RD_AC)	.19***	.24*	.29*	.07*	.03*	.01*	.03**	.06*
Marketing absorptive capacity (MK_AC)	.02	.11	.05	.02	.01**	.06*	.04*	.05
Key-customer absorptive capacity (KC_AC)	.09*	.01	.20*	.04	.09*	.10*	.12*	.10
RAR × RD_AC	**.13***	**2.23***	**.84***	**.41***	**.66***	**.10****	**.07****	**.80***
MAR × MK_AC	**.10***	**.07**	**.08**	**.04***	**.04***	**.09****	**.06***	**.07***
KCR × KC_AC	**.02**	**.42***	**.28****	**.08**	**.03**	**.02**	**.03**	**.05**

*Significant at the 10% level (two-tailed, one-tailed for interaction terms).
**Significant at the 5% level.
***Significant at the 1% level.
Notes: IPO value is measured by the initial offer value other than indicated. All models include control variables. Entries are coefficients.

tionships.[8] We then added the inverse Mills ratio derived from this selection model in Equation 2 and reran the analysis. (We no longer included the lambda derived from the IPO selection equation, because the error terms of the two selection equations can be correlated.) The last column of Table 4 reports these results, which are consistent with those in Table 3.

Additional Analysis: Determinants of Young Technology Firms' Absorptive Capacity

We have estimated absorptive capacity with SFEs and observed significant heterogeneity in absorptive capacity across firms. Next, we conduct additional analysis to explain this heterogeneity. Existing research on the determinants of absorptive capacity has almost exclusively focused on mature firms and thus has examined the impact of factors such as organizational structures (e.g., Cohen and Levinthal 1990) and functional capabilities (e.g., Narasimhan, Rajiv, and Dutta 2006). However, for most start-ups, organizational structures or functional capabilities have yet to be developed (and that is why they are in a more urgent need to absorb know-how from the outside). Therefore, we focus on the upper-echelon structure to explain start-ups' absorptive capacity (top management executives and board of directors) because upper echelons play a significant role in deploying start-ups' resources (e.g., Kor 2003).

If a young firm has a diversified upper-echelon team (e.g., each executive or director served a different organization before joining the current firm), it is likely to have a variety of perspectives to examine potential resources and thus enjoy an advantage in identifying external know-how. Diversity in background may also predict weaker social ties among upper echelons, compared with upper echelons with very similar backgrounds (e.g., a group of former IBM employees who started their own business). The social network literature argues that weak ties are efficient for sharing new knowledge because they facilitate access to novel information (Granovetter 1973). In contrast, strong ties may constrain the inflow of new knowledge by handicapping the search process. Thus, upper-echelon diversity can positively influence the efficiency in absorbing know-how (given the maximal amount of know-how available).

Conversely, the level of common language and the strength of expertise in overlapped domains decrease as the diversity in upper echelon increases. This can reduce the efficiency in communicating and applying the external know-how identified, thus harming absorptive capacity. Moreover, communication within a diversified upper-echelon team may suffer from biased information sampling, in which in-common information rather than novel information is shared (Shiflett 1979). Taken together, the theoretical arguments of upper-echelon diversity on absorptive capacity seem equivocal, calling for an empirical resolution.

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[8] Following Stuart (1998) and Villalonga and McGahan (2005), we included sales (to control for firm size), R&D expenditures (R&D resources), selling and marketing expenditures (marketing resources), number of patents (technological base), number of trademarks (stock of marketing assets), return on assets (current general accounting performance), and industry dummy to predict the likelihood of forming B2B relationships. The dependent variable in the probit regression equals 1 if the firm has formed at least one pre-IPO B2B relationship. We employed robust variance estimator to correct for heteroskedasticity. We calculated the inverse Mills ratio the same way as in the approach to control for IPO decision self-selection bias.

We follow Narasimhan, Rajiv, and Dutta (2006) and specify the empirical model as $\ln(\mu_i) = \mu^* + Z\gamma + \sigma_\mu \varepsilon$.[9] Because μ captures inefficiency in absorbing know-how, we expect a Z variable that enhances absorptive capacity to have a negative coefficient (i.e., it reduces the inefficiency). In addition to examining upper-echelon diversity, we also control for the other characteristics of the upper echelons. (The list of Z variables and their coefficients is available in Table WA-2 in the Web Appendix at www.marketingpower.com/jmnov11.) The results suggest that, in general, a diversified upper-echelon team benefits a start-up firm's absorptive capacity. For example, the diversity in the experience of R&D executives (e.g., vice president of R&D, chief technology officer) decreases the inefficiency in absorbing R&D know-how ($-.263$, $p < .1$) and thus enhances R&D absorptive capacity. The diversity in the background of a firm's upper echelons decreases the inefficiency in absorbing marketing know-how ($-.072$, $p < .1$) and thus enhances marketing absorptive capacity. Moreover, the upper echelons' strength in a particular functional area is significantly associated with the matching type of absorptive capacity. For example, firms with more R&D executives in its upper echelons are likely to have stronger R&D absorptive capacity. The number of upper echelons with marketing backgrounds (i.e., those who held marketing and sales positions before joining the current firm) and the number of marketing and sales executives are positively associated with marketing and customer absorptive capacities, respectively.

Discussion

Theoretical Contribution

A systematic review of prior literature indicates that B2B relationships can both benefit firm performance and pose potential risks, and the overall effect might be contingent. We examine the financial value of three types of B2B social capital, conditional on a complementary capability, the relevant type of absorptive capacity, in the context of young IPO firms.

The study enriches the marketing strategy literature by demonstrating the role of relevant absorptive capacity in B2B relationship management. It is one of the first studies to link absorptive capacity with B2B social capital and firm value. In contrast to previous absorptive capacity research that focusing primarily on R&D know-how, we expand this concept and unveil its importance in marketing alliance and customer relationships. Although extant research has recognized that customer relationships may pose mixed effects on firm performance (e.g., Danneels 2003), few studies have explicitly investigated the financial value of customers. We fill in this research gap by demonstrating the impact of key customers on IPO value. We also contribute to the customer relationship management literature by highlighting the role of absorptive capacity in realizing key customer relationships' financial potential.

We add to the literature that has attempted to link young firms' interfirm networks with their financial performance. Uzzi (1999) investigates the impact of relationship embeddedness on start-up borrowing (interest rates on loans). In contrast, we focus on another significant financing event, the IPO, and examine the factors that help increase the value potential of B2B relationships. Our study also resolves a conundrum that prior research in management has faced. Gulati and Higgins (2003) find that despite the significant investments involved, the number of a firm's strategic alliances does not have significant impact on its IPO success. In contrast, we find that although the main effects of R&D and marketing alliance relationships are not significant, their interactions with relevant absorptive capacity significantly enhance IPO value. Thus, our study provides empirical evidence for sociology theories on the financial potential of social capital. More important, we reveal the conditions under which such potential can be best realized.

This study also makes distinctive contributions to the marketing–finance interface literature. First, we show that marketing efforts do pay off insofar as they both (1) help build up valuable B2B social capital (e.g., the significant main effect of KCRs) and (2) enhance the financial benefits of such social capital (e.g., the significant moderating effects of marketing absorptive capacity). Second, this study is among the first to investigate the financial impact of marketing resources and capabilities in the IPO market. This unique perspective provides insights into marketing strategy and financial performance of start-up firms, which have rarely been studied in the extant marketing–finance literature. Third, the study adds to the emerging contingency perspective in the marketing–finance interface by demonstrating that complementary assets such as absorptive capacities are required to benefit from B2B relationships.

Managerial Implications

Communicating the value of absorptive capacity. As we show in Figure 2, investors are likely to respond negatively when a young firm lacks the ability to leverage R&D and marketing alliance relationships. Conversely, firms that have strong absorptive capacity can financially benefit from these B2B relationships because they can understand, evaluate, and assimilate the relevant external resources and capabilities from their partners. These complementary and supplementary gains to their existing capabilities are valued by the market because they are likely to enable young firms to design superior value propositions for their market into the future. Therefore, start-ups first must be cognizant of the impact of these factors and develop their absorptive capacity. For example, our additional analysis indicates that young firms may be able to enhance absorptive capacity by recruiting executives or directors with different backgrounds from the current upper-echelon team. Second, managers in a firm possessing strong absorptive capacity need to articulate the benefits of this capability in meetings with analysts to convince investors of the importance of B2B relationships for the firm. In support of this, an investment manager suggested that firms must trumpet this ability along with highlighting the relationships during the road shows prior to IPO. He argued that this better informs investors and that

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[9] The term μ_i (consistent estimate M_i has been derived as in footnote 5) is the mode of inefficiency term η, Z represents the independent variables including upper-echelon factors (note that the Z variables here explain the inefficiency in absorbing know-how, while the three categories of X variables in Equation M1 explain the maximal amount of know-how absorbable), γ is the vector of coefficients, ε is a standard normal variable, σ_μ^2 is the variance in μ due to unobservable effects. We measure diversity as the proportion of the number of unique organizations that all upper-echelon members (or all R&D or marketing and sales executives) had served relative to the sum of the number of organizations that each upper-echelon member (or each R&D or marketing and sales executive) had served before joining the current firm. Estimates of γ can then be derived from maximum likelihood estimation.

> one or two things may happen ... (1) investors will qualitatively be more excited about the company's prospects, which leads to bigger book (more demand for the stock) being built, which will lead to the offering being priced at the high point of the range, or (2) investors assess a lower discount rate to future projections, which pumps up value.

Going beyond statutory disclosure of customer relationships. Accounting standards (Financial Accounting Standards Board Statements 14 and 131) require firms to report customers who contribute 10% or more of a firm's revenues because it makes the firm vulnerable to customer switching and therefore more risky. However, the pioneering finding in this study of the positive impact of key customer relationships suggests that, unlike R&D relationships, the mere existence of key customer relationships creates IPO value. Thus, it pays off for young firms to invest in key customer relationships to enhance firm value. However, while the results do not necessarily indicate that key customer relationships are more important than other types of B2B relationships, it seems that the investment community finds it relatively easier to assign values to key customer relationships because the outcomes (e.g., sales revenue generated from key customers) are directly observable. Moreover, young firms with adequate levels of customer-related absorptive capacity are not only more sensitive to business opportunities in the customer firm but also perhaps more proactive in exploiting them. Taken together, the implication for managers is that they should go beyond statutory disclosure to capitalizing on the disclosure. Managers could communicate to institutional and individual investors that despite the risk of credit concentration, key customers yield cash flow benefits that lead to greater firm value.

Role of marketing in young technology firms. Marketing usually plays a secondary role in young technology firms, which are typically dominated by technical personnel. However, this study suggests that these young firms would gain significantly in terms of how they are valued if they invest in marketing. For example, investing in customer management pays through the direct effect of key customer relationships, and efforts in developing marketing absorptive capacity can help augment the financial benefits of marketing alliances. Moreover, our additional analysis suggests that recruiting marketing personnel and senior managers with marketing and sales experience (as members of the upper echelon) will enhance marketing and key customer know-how absorptive capacities. The findings suggest that chief marketing officers and other marketing managers of start-ups should make a case for investments in marketing and customer management expertise and use these results to better justify to chief executive officers and chief financial officers the financial value of such investments.

Limitations and Directions for Further Research

Although we employ multiple methods to enhance the robustness and rigorousness of the empirical analyses, we can only test association, not causation. However, the IPO value measure is forward looking, while the exogenous variables in the model are contemporaneous or lagged. Thus, the reverse direction of causation is less likely in this context. Our systematic theory construction strongly supports the direction of the relationships hypothesized and tested.

We reveal the significant role of absorptive capacity in B2B relationship management and financial market capitalization and explore the impact of upper-echelon structure on young firms' absorptive capacity. Further research could investigate the antecedents of absorptive capacity more systematically and generate more insights into how start-ups can develop absorptive capacity. In addition, further research could examine firms' effectiveness in applying and further enhancing its previously developed absorptive capacity in newly formed B2B relationships.

Mizik and Jacobson (2007) show that changes in marketing spending influence stock market returns following seasonal equity offering. Marketing capabilities and B2B relationships can also be expected to affect seasonal equity offering performance. In this context, further research could explore the dynamics in the valuation process (i.e., how the value of start-ups changes when they acquire new resources and capabilities). Future studies can also develop richer measures of B2B social capital. In addition to network structures, strength of ties can be examined. It is even more important to understand how to manage social capital and realize its value potential than to merely observe the nature of B2B network resources. A comparative study of the firm value drivers for start-ups and those for established firms would also be meaningful.

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Arun Lakshmanan & H. Shanker Krishnan

The Aha! Experience: Insight and Discontinuous Learning in Product Usage

Success of many products depends on how consumers learn to use them. This research suggests that initial product trial may lead to jumps in consumer learning. Such discontinuities in learning co-occur with the experience of insight—namely, a better conceptual understanding of how to use the product. Notably, such learning also positively affects downstream outcomes such as affect and usage intentions. Whereas exploration during initial trial facilitates insight-based learning, usage instructions seem to limit this type of learning. The implication for marketing managers is to structure initial trials in a manner conducive to exploration, thus leading to insight-driven learning and the associated positive outcomes.

Keywords: insight, discontinuous learning, skills, learning, product usage

Many consumer products entail physical usage to derive benefits. As such, how consumers interact with and learn to use these products is critical in influencing product adoption (Robertson and Gatignon 1986; Shih and Venkatesh 2004) and in defining the customer experience (Dahl and Moreau 2007; Moreau and Dahl 2005). For example, the tremendous and continuing success enjoyed by Nintendo's motion sensitive Wii game has been attributed to the active role the consumer plays in learning to use it and continued engagement in the consumption experience.

Consider a consumer who is eager to try out a new Wii game that has just hit the stores. She takes a moment to review the instructions and then begins playing. After a few trials, something clicks in her mind, and she "gets" the new interface. Almost concurrently, she begins playing considerably better. This sudden improvement in performance (viz., discontinuous learning) makes her perceive the game as fun. Note that anecdotal evidence on jumps in learning and performance are plentiful, coming from fields as diverse as animal cognition (Grether and Maslow 1937), evolutionary biology (punctuated equilibriums; Gould and Eldredge 1977), organizational learning (e.g., Sinkula 1994), and technological evolution (Sood and Tellis 2005).

The preceding example illustrates the benefit derived from the process of learning, and yet research in marketing has primarily used a cost lens to study how consumers learn to use products (e.g., Johnson, Bellman, and Lohse 2003; Murray and Haubl 2007; Wernerfelt 1985). From this latter viewpoint, learning to use a product is a cost to be overcome by the consumer and, consequently, the firm. For example, firms can provide free trials to reduce the learning cost for the consumer. Over time and repeated use, the consumer becomes habituated to (or invested in) the product, which in turn limits switching. Not surprisingly, the dominant theory representing consumer learning is the power law (Johnson, Bellman, and Lohse 2003), which depicts a steady process by which consumers learn to use products.

In contrast, discontinuous improvement in usage learning offers a benefits-based approach and has not been explored in much detail. Nor has a coherent theory been developed to explicate how discontinuous learning can manifest. This is a noteworthy omission because there are numerous examples of new products that have succeeded (or failed) as a result of active consumer learning. For example, the pervasiveness of the Wii is attributed to how intuitively consumers get up to speed on the motion-sensitive remote (Mossberg and Boehret 2006). Similarly, the phenomenal success of the iPhone is credited to how well consumers adapted to the touch-screen-enabled interaction. It is no coincidence that these product launches were followed by strong positive reactions, triggering an almost cultlike attachment to the product through numerous blogs, social networks, and customer interest groups. We believe that the positive consumer sentiment is the result of a discontinuous learning path traversed by consumers during initial trial.

Accordingly, the goal of this research is, first, to demonstrate that consumers indeed learn to use products in a discontinuous way and that this form of learning is accompanied by the experience of insight in relation to product usage. Second, we test the effect of such learning patterns on downstream measures of liking and usage intentions. Third, we explicate the antecedent role of exploration in the process. Finally, we explore how firms can encourage such types of learning.

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The research described here contributes to extant knowledge in three ways First, we outline a different form of learning—discontinuous learning—and contrast it with the traditional power law view Our research suggests that consumers' proficiency gain with using new products is sometimes characterized as a sudden, abrupt change rather than the commonly expected gradual improvement Second, we draw on the creativity and human learning literatures to explicate (1) the role of insight in learning to use a product, (2) insight's relationship to discontinuous learning, and (3) its unique behavioral consequences Our findings suggest that discontinuous learning is correlated with the experience of insight In turn, this seems to have unique positive consequences for future usage Third, this research is among the first in marketing to investigate the development of procedural knowledge (know-how), thereby enriching extant consumer learning literature Prior research in consumer learning has relied largely on declarative knowledge ("know-what") such as brand–benefit associations and product/brand knowledge (Table 1) Our research is among the first to expand consumer learning into the procedural domain by studying product usage Next, we review the literature pertaining to learning of product usage to provide the background for our research

Learning to Use Products

Types of Knowledge

A long-standing framework describing human memory and knowledge is the declarative–procedural model originally laid out by Cohen and Squire (1980) In this framework, "declarative" refers to the learning, representation, and use of knowledge pertaining to facts and events, whereas "procedural" refers to the learning and control of sensorimotor and cognitive skills as well as in the development of routines such as habits The declarative system has been implicated in the rapid learning of arbitrarily related information (one-shot learning) and the propositional and/or associative linking of information and concepts From a consumer learning perspective, brand–benefit/product–benefit associations and knowledge of product attributes fall in the domain of declarative knowledge (e g , Van Osselaer and Janiszewski 2001) In contrast, procedural knowledge is primarily related to how to do things (Squire 1986) Because how-to knowledge is largely embodied in the actual action undertaken (Anderson 1999), it may not be readily accessible to verbalization For example, even though a person may get better at swimming through practice, he or she may not be readily able to describe that knowledge It is usually best demonstrated when the person actually performs the actions

Although various models of consumer learning have been advanced over time, a majority of these have been grounded in declarative paradigms Models such as adaptive learning or human associative memory models in consumer research have explicitly referred to their declarative roots (e g , Van Osselaer and Janiszewski 2001) Furthermore, theories on analogical transfer (e g , Gregan-Paxton 2001) and consumer covariation judgments (Hutchinson and Alba 1997, Van Osselaer and Alba 2000) have been developed in declarative, brand-association, and attribute-inference contexts Even models of experiential consumer learning (e g , Hoch and Ha 1986) have been explicated principally from a declarative standpoint

In contrast, product usage primarily relies on procedural knowledge Notably, many consumer products require a sequence of actions to be performed, sometimes including physical manipulation, to use them In day-to-day product usage contexts, how-to knowledge is made up of both explicit step-by-step scripts of what is to be done, as well as a proficiency embedded in the actual doing of the task For example, how-to knowledge in using a video game joystick consists of both a step-by-step, verbally describable script of what controls need to be manipulated (declarative akin to instructions found in a user manual) and a degree of skill in physically manipulating the joystick (procedural embedded in actual task performance) Thus, although learning to use a product primarily calls on procedural knowledge, declarative knowledge is often closely intertwined in this process and may, in some situations, foster superior learning Moreover, the extent to which a person's declarative knowledge is naturally engaged during usage may determine the learning pathway traversed during product trial We next describe two possible learning paths

Two Learning Paths

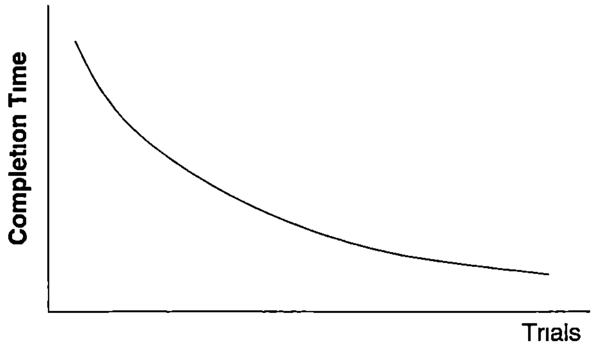
With two types of knowledge involved in usage learning, the process of learning to use products may also follow different routes depending on how learning occurs during initial product trial For example, as a consumer uses a product repeatedly, his or her procedural knowledge—the fluency with which individual steps are performed—improves with each repetition This improvement is typically gradual as the consumer becomes more familiar with performing the steps over time, thereby gaining *efficiency* However, using a product also might lead to greater conceptual learning as the user explores the "usage space" and discovers optimal ways to perform a task with the product Typically, when this happens, it also leads to the user forming an effective mental model of the product (Norman 2002) This process is similar to the formation or completion of a schema often described as a type of insight (Schilling 2005, Smith, Ward, and Finke 1995) In this connection, exploration of the product (or "playing around" with it), by helping the generation of a mental model, helps foster greater *effectiveness* in performing tasks Thus, performance in these situations might exhibit abrupt improvements rather than a smooth, gradual change (Figure 1)

In both these routes, the consumer eventually attains proficiency in using the product However, in the first path, proficiency is primarily attained through enhanced procedural knowledge, whereas in the latter (discontinuous) path, proficiency gains are also accompanied by enhanced conceptual (or declarative) knowledge These paths are not necessarily orthogonal Only the trend of performance improvement differs in each pathway, and this difference in learning paths offers unique consequences for product usage, which forms the focus of the current research (Figure 2)

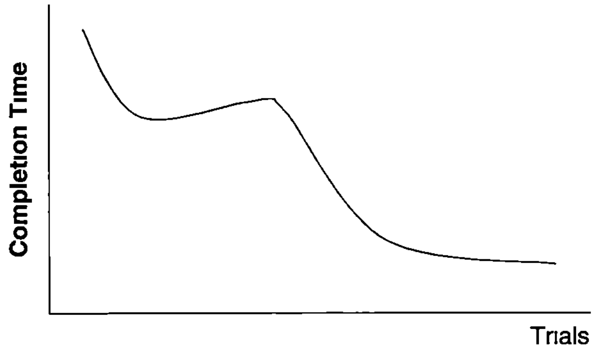
Layout of Studies

We depict the layout of studies in Figure 3 In Study 1, we first provide evidence of two types of learning—power law and discontinuous learning—and theoretically link the

FIGURE 1
Trend of Completion Times



Power Law Learning



Discontinuous Learning

experience of insight with discontinuous learning Study 2 highlights the unique behavioral consequences of insight In Study 3 we experimentally manipulate a key antecedent of insight-driven learning—namely, exploration Finally, in Study 4, we show how a commonly followed firm practice—written instructions (e g , in manuals)—can act as a boundary condition to insight-driven learning

Study 1: Discontinuous Learning and Insight

Consider a consumer who is learning to use a new smartphone that combines appointment books, diaries, calendars, and cameras to support communication activities This product integrates several tasks looking up numbers, dialing, talking, exchanging photographs, text messaging, and e-mailing Each of these tasks further comprises specific actions, such as retrieving voice mail or sending e-mails In turn, each action requires a set of operations, such as key presses and clicks, to perform the task (activity theory, Bødker 1989, Leont'ev 1974, Norman 2005) As users repeat these operations, they acquire proficiency

The most well-accepted principle used to describe this empirical phenomenon is the power law of practice (Newell and Rosenbloom 1981), which states that repetition and performance (task completion times) are related by monotonically diminishing returns such that while performance improves with practice, it does so at a diminishing rate Essentially, the theoretical argument is that when people are learning new skills, significant gains in performance occur early and are followed by gradually diminishing gains over time This relationship has been best modeled using a power function of the following general form

$$T = BN^{-\beta},$$

where T is the performance time (time needed to complete a task), B is the time taken in the first trial, and N is the trial number (the amount of practice) The rate at which performance changes is represented by β, the negative sign indicating that completion time decreases at the rate specified by β Studies in the marketing field have also attested to the power law principle and its ability to explain learning effects better than a linear trend at the aggregate level (Johnson, Bellman, and Lohse 2003) Accordingly, the following hypothesis pertains to consumers' learning curves at the aggregate level, regarding product usage performance (reflected by task completion times)

> H_1 In the aggregate, learning curves based on repeated use of a product are best approximated by the power law (versus a linear trend)

FIGURE 2
Antecedents and Consequences of Insight and Discontinuous Learning

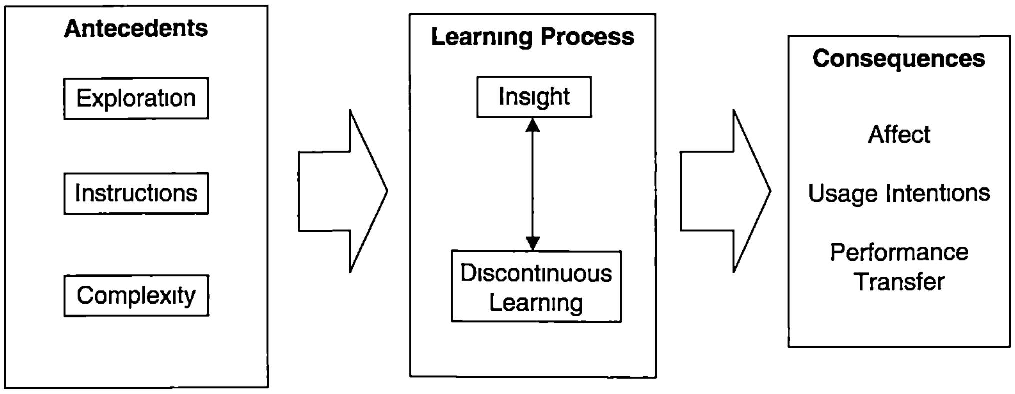


TABLE 1
Extant Consumer Learning Research

A: Declarative Knowledge

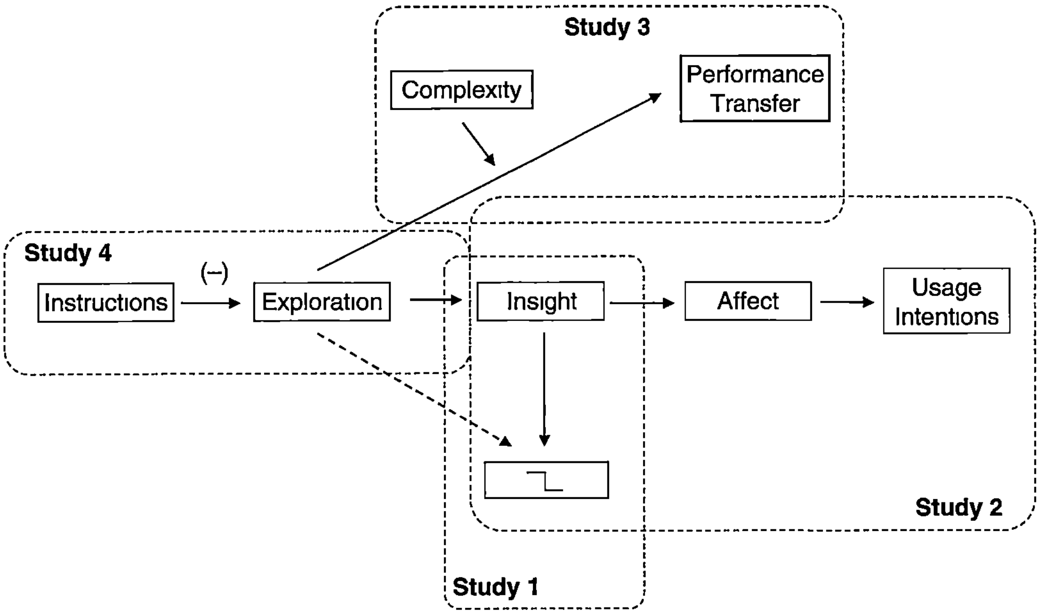
Low Involvement/Behavioral Learning	
Nord and Peter (1980)	A Behavior Modification Perspective on Marketing
Rochschild and Giadis (1981)	Behavioral Learning Theory Its Relevance to Marketing and Promotions
Hawkins and Hoch (1992)	Low-Involvement Learning Memory Without Evaluation
Janiszewski and Warlop (1993)	Influence of Classical Conditioning Procedures on Subsequent Attention to the Conditioned Brand
Hawkins, Hoch, and Meyers-Levy (2001)	Low-Involvement Learning Repetition Effects on Learning from Ads
Attribute and Associative Learning	
Johnson and Russo (1984)	Product Familiarity and Learning of New Information
Cole and Houston (1987)	Encoding and Media Effects on Consumer Learning Deficiencies in the Elderly
Burke and Srull (1988)	Competitive Interference and Consumer Memory for Advertising
Hutchinson and Alba (1991)	Ignoring Irrelevant Information Situational Determinants of Consumer Learning
Macklin (1996)	Preschoolers' Learning of Brand Names from Visual Cues
Janiszewski and Van Osselaer (2000)	Connectionist Model of Brand-Quality Associations
Van Osselaer and Alba (2000)	Consumer Learning and Brand Equity
Mukherjee and Hoyer (2001)	The Effect of Novel Attributes on Product Evaluation
Van Osselaer and Janiszewski (2001)	Two Ways of Learning Brand Associations
Shapiro and Spence (2002)	Factors Affecting Encoding, Retrieval, and Alignment of Sensory Attributes in a Memory-Based Brand Choice Task
Law (2002)	Can Repeating a Brand Claim Lead to Memory Confusion? The Effects of Claim Similarity and Concurrent Repetition
Wood and Lynch (2002)	Prior Knowledge and Complacency in New Product Learning
Janiszewski, Noel, and Sawyer (2003)	A Meta-Analysis of the Spacing Effect in Verbal Learning
Van Osselaer and Alba (2003)	Locus of Equity and Brand Extension
Van Osselaer, Janiszewski, and Cunha (2004)	Stimulus Generalization in Two Associative Learning Processes
Eisenstein and Hutchinson (2006)	Action-Based Learning Goals and Attention in the Acquisition of Market Knowledge
Cunha, Janiszewski, and Laran (2008)	Protection of Prior Learning in Complex Consumer Learning Environments
Cunha and Laran (2009)	Asymmetries in the Sequential Learning of Brand Associations Implications for the Early Entrant Advantage
Griffin and Broniarczyk (2010)	The Slippery Slope The Impact of Feature Alignability on Search and Satisfaction
Poynor and Wood (2010)	Smart Subcategories How Assortment Formats Influence Consumer Learning and Satisfaction
Others	
Hoch and Deighton (1989)	Managing What Consumers Learn from Experience
Peracchio (1992)	How Do Young Children Learn to Be Consumers? A Script Processing Approach
Learning by Analogy	
Gregan-Paxton and Roedder-John (1997)	Consumer Learning by Analogy A Model of Internal Knowledge Transfer
Gregan-Paxton (2001)	The Role of Abstract and Specific Knowledge in the Formation of Product Judgments An Analogical Learning Perspective
Gregan-Paxton and Moreau (2003)	How Do Consumers Transfer Existing Knowledge? A Comparison of Analogy and Categorization Effects
Gregan-Paxton, Hoeffler, and Zhao (2005)	When Categorization Is Ambiguous Factors That Facilitate the Use of a Multiple Category Inference Strategy
Shapiro, Spence, and Gregan-Paxton (2009)	Factors Affecting the Acquisition and Transfer of Novel Attribute Relationships to New Product Categories

TABLE 1
Continued

	A: Declarative Knowledge
Covariation Judgments and Inferences	
Bettman, Roedder-John, and Scott (1986)	Covariation Assessment by Consumers
Roedder-John, Scott, and Bettman (1986)	Sampling Data for Covariation Assessment The Effect of Prior Beliefs on Search Patterns
Pechmann and Ratneshwar (1992)	Consumer Covariation Judgments Theory or Data Driven?
Broniarczyk and Alba (1994)	The Role of Consumers' Intuitions in Inference Making
Hutchinson and Alba (1997)	Heuristics and Biases in the Eye-Balling of Data The Effects of Context on Intuitive Correlation Assessment
Experiential Learning	
Hoch and Ha (1986)	Consumer Learning Advertising and the Ambiguity of Product Experience
Ha and Hoch (1989)	Ambiguity, Processing Strategy, and Advertising-Evidence Interactions
Huffman and Houston (1993)	Goal Oriented Experiences and the Development of Knowledge
West (1996)	Predicting Preferences An Examination of Agent Learning
West, Brown, and Hoch (1996)	Consumption Vocabulary and Preference Formation
Warlop, Ratneshwar, and Van Osselaer (2005)	Distinctive Brand Cues and Memory for Product Consumption Experiences
Schlosser (2006)	Learning Through Virtual Product Experience The Role of Imagery on True Versus False Memories
Latour and Latour (2010)	Bridging Aficionados' Perceptual and Conceptual Knowledge to Enhance How They Learn from Experience
Quantitative Models of Consumer Learning	
Keane and Erdem (1996)	Decision Making Under Uncertainty Capturing Dynamic Brand Choice Processes in Turbulent Consumer Goods Market
Villas-Boas (2004)	Consumer Learning, Brand Loyalty, and Competition
Bradlow, Hu, and Ho (2004)	Modeling Behavioral Regularities of Consumer Learning in Conjoint Analysis
Akcura, Gonul, and Petrova (2004)	Consumer Learning and Brand Valuation An Application on Over-the-Counter Drugs
Lewis (2005)	Incorporating Strategic Consumer Behavior into Customer Valuation
Iyengar, Ansari, and Gupta (2007)	A Model of Consumer Learning for Service Quality and Usage
Freimer and Horsky (2008)	Try It, You Will Like It Does Consumer Learning Lead to Competitive Price Promotions?
Narayanan and Manchanda (2009)	Heterogeneous Learning and the Targeting of Marketing Communication for New Products
Zhao, Zhao, and Helsen (2011)	Consumer Learning in a Turbulent Market Environment Modeling Consumer Choice Dynamics After a Product Harm Crisis
	B: Procedural Knowledge
Effects of Procedural Knowledge	
Johnson, Bellman, and Lohse (2003)	Cognitive Lock-In and the Power Law of Practice
Murray and Haubl (2007)	Explaining Cognitive Lock-In The Role of Skill-Based Habits of Use in Consumer Choice
Murray and Bellman (2011)	Productive Play Time The Effect of Practice upon Consumer Demand for Hedonic Experiences
Expectation Versus Actual Usage (Learning from Usage)	
Moreau and Wood (2006)	From Fear to Loathing? How Emotion Influences the Evaluation and Early Use of Innovations
Burson (2007)	Consumer Product Skill Matching The Effects of Difficulty on Relative Self-Assessment and Choice
Acquisition of Procedural Knowledge	
Lakshmanan, Lindsey, and Krishnan (2010)	Practice Makes Perfect? When Does Massed Learning Improve Product Usage Proficiency

Notes Predominant focus of this approach is on isolating and quantifying "consumer learning" [usually of quality of the product] as a factor in purchase behavior change time For complete bibliographic information for these sources, see the Web Appendix at http //www marketingpower com/jmnov11

FIGURE 3
Conceptual Overview and Layout of Studies



Notwithstanding the popularity of the power law, a growing body of research points to its limitations in uniquely describing individual-level learning (Rickard 1997) For example, individual's gains in cognitive skills may deviate significantly from the power law (Rickard 1999) Therefore, if individual curves are analyzed separately, what other pathways can we expect? Multiple pathways are possible, such as power curves of varying parameters, exponential curves, and logarithmic curves (Estes 1956, Myung, Kim, and Pitt 2000) We hypothesize that some of them are likely to take a specific form—namely, a discontinuous learning pattern

The form of the curve may be predicted by the way proficiency is acquired during initial product use As described previously, one route is when repeated use of a product leads to the development of action-based production rules (Anderson 1999), in turn leading to more proficient use Efficiency is gained through practice This path is best illustrated by the incremental gains observed in most power law curves of learning An alternative path entails conceptual learning as the user explores the usage space and discovers optimal ways to perform the given task As the person uses the product, he or she forms a mental model of the product (Norman 2002), which helps with task performance Effectiveness is gained along with enhanced conceptual understanding In turn, increased effectiveness is more likely to lead to sudden gains in proficiency (Rickard 1999), thereby leading to discontinuous learning curves (Figure 1)

Furthermore, when the user engages in discovery-based learning, in addition to greater physical familiarity with the product, he or she is also likely to develop a better understanding of how the steps in product use and various features hang together Among the different conceptualizations of cognitive insight in the creativity literature (Schilling 2005), the process by which a schema is completed and reorganizing of information occurs closely describes the formation of a product's mental model through usage The subjective experience underlying this process is correlated with the experience of an "Aha!" moment (Mayer 1995, Schilling 2005, Smith, Ward, and Finke 1995) This experience is akin to that of a first-time user of the Wii Nunchuk, who, while learning to manipulate the remote, develops not only the procedural, physical skill in operating it but also gains an understanding of how the device works for him or her (an Aha! experience) In this context, consistent with prior conceptualizations of cognitive insight, we define insight as an experience in which product usage for the individual translates from a relatively unconnected set of steps into a meaningful sequence of actions In a way, the occurrence of insight signals a change in a person's declarative knowledge (reorganizing of information into a mental model, Schilling 2005) Combining the preceding two expectations, formally, we hypothesize the following

H_2 At the individual level, learning curves also exhibit discontinuities in performance (completion times), in addition to power law learning

H_3 Discontinuous learning is more positively related to the occurrence of insight (vs power law learning)

Two caveats are worth noting First, power law and discontinuous learning curves are both possible at the individual level—each being indicative of a particular learning path In addition, although we expect a significant proportion of discontinuous learners, we make no predictions about their relative proportion Second, the presence of individual discontinuous curves does not contradict H_1, because all consumers do not improve at the same time, averaging discontinuous curves across each trial effectively hides its existence from aggregate-level analyses

Overview of Experimental Protocol

We conducted a laboratory-based study using Audacity, a software product used for audio recording, mixing, file modification, and organization of digital music. Such products are highly relevant to our participant group because they involve digitally stored music; in addition, similar products have been used in recent experimental research in marketing (e.g., Thompson, Hamilton, and Rust 2005). Our broad experimental approach uses multiple product usage episodes (trials) to allow for and track participants' learning. We constructed a task (detailed in the next section) for which completion time could be measured unobtrusively. Task completion time has a rich history in prior psychology and human-factors research as a measure of proficiency (for a review, see Hornbaek 2006) and has been used in marketing to tap into user skills as well as related downstream phenomena (e.g., Huang, Lurie, and Mitra 2009; Johnson, Bellman, and Lohse 2003; Moe and Yang 2009; Murray and Haubl 2007). The experimental task was repeated within subjects, and completion time was measured for each repetition. We used the completion times for each participant to deduce the type of learning curve. We outline the details of the procedure next.

Method

One hundred fifty-three undergraduate marketing students at a large midwestern university participated in exchange for course credit. Data were collected using computers on which Audacity was preinstalled. The task (on which participants learned to use the product) required them to use Audacity to change the baseline volume of digital music files stored on the respective computers. This type of audio modification is particularly relevant to the participants because it may be eventually used to change ringtones, alarms, or chimes in a variety of digital devices. Because Audacity is an open-source software product, we also collected information on participants' prior exposure to it (less than 10% had any prior exposure). Analyses using this variable revealed no differences across groups, and we collapsed data for hypothesis testing.

At the outset of the study, a brief description of Audacity was shown to all participants, introducing it as a beta version of an upcoming product needing user testing. Included in the description were details about its purpose, various features, and different ways digital music can be modified and managed using it. After this, instructions on how to perform the usage task were shown once (Part 1 of the Web Appendix at http://www.marketingpower.com/jmnov11). Then, participants completed the specified task multiple times during the session. A set of six identical files (using different file names to avoid suspicion and tedium) were placed in a folder. Each participant completed the main experiment through MediaLab, and at the appropriate juncture, Audacity was opened to undertake the usage tasks. We ascertained correct completion using a probe question at the end of each trial. The analyses showed that all participants completed the tasks correctly.

We plotted learning curves for each participant using the completion times (measured unobtrusively using MediaLab) for each trial, and independent coders categorized these plots into two classes: discontinuous curves or power law curves (see Figure 1). Coders, blind to the conditions of the experiment, were instructed to code the graphs according to the criterion of whether they observed a gradual, smooth reduction in completion times or whether they saw a distinct, abrupt drop. If they did see a drop, they were instructed to mark the trial on which they observed the drop. Intercoder agreement was high (Krippendorff's $\alpha = .79$), and disagreements were resolved by discussion.

In addition, cognitive response protocols were collected toward the end of the session for process analysis. These were coded for the presence of words/phrases showing that the participant was able to form a deeper understanding of the product usage during learning trials. This procedure is especially common in usability research (Ericsson 2006; Van den Haak and De Jong 2003) and also has a rich history in psychology (Crutcher 1994; Ericsson and Simon 1993; Payne 1994) and consumer decision making (Beihal and Chakravarti 1982) for process tracing. Phrases were coded for evidence of a mental model of how the product was to be used and how its features fit together. Demographics and covariates were collected at the end.

Covariates

Among the variables of interest for this study, we placed particular focus on four variables that could potentially affect participants' information processing with respect to usage learning through product trial. We measured prior knowledge of the product category using six items. All items loaded onto a single factor, and the summated scale was reliable (Cronbach's $\alpha = .88$). We used a measure of anxiety with technological products (four items) adapted from prior research (Meuter et al. 2005) ($\alpha = .85$). In addition, we measured product category relevance using a three-item scale ($\alpha = .91$). Finally, after the experimental session and an unrelated filler task, we administered the need-for-cognitive-closure scale (Webster and Kruglanski 1994). We include all covariates in regression models and report them if they are significant.

Analysis and Results

To test the power law hypothesis for aggregate learning curves (H_1), we fit a model of the form given in Equation 1 to aggregate completion times. The resulting model had a good fit, and the fit was significantly better than the benchmark linear model ($R^2_{\text{Power}} = .97$, $R^2_{\text{Linear}} = .81$, $F(1, 915) = 312.12$, $p < .001$), providing direct support for H_1.

To test H_2, we performed the following steps. To cross-validate coders' categorization, we first estimated the power law model (Equation 1) on individual completion time data that were classified as power law curves:

$$\text{CT} = \alpha \times \text{TRIAL}^{-\beta}, \qquad (1)$$

where CT is completion time for the usage task, α is a constant representing baseline performance at the first trial, β represents the rate parameter governing the negative change in completion times over trials, and TRIAL is the number of the learning trial. In addition, we fit the sigmoid-shaped dose-response curve used in the life sciences (Motulsky and Christopoulos 2003) to test for abrupt changes in completion times. The sigmoid curve has been used to model discontinuous changes, such as radical innovation and the impact of disruptive technologies (e.g., Sood and Tellis 2005), and thus forms an appropriate foundation for modeling the discontinuous change in individual completion times. The functional form is given by the following:

$$(2) \qquad CT = \beta + \frac{\alpha - \beta}{1 + 10^{(TRIAL - \gamma)}},$$

where α and β are the top and bottom intercepts and γ is the slope parameter, which also governs the trial number in which completion time drops abruptly. We used the Bayesian information criterion (BIC, Schwarz 1978) to assess model fit because it imposes a strong penalty for additional parameters (thereby correcting for overfitting).

Specifically, we fit both Equations 1 and 2 on each group with TRIAL as independent variable (numbered from 1 to 6) and completion time (CT) as the dependent variable. We freely estimated model parameters for the power model (α = baseline performance, β = rate) as well as the sigmoid model (α = top intercept, β = bottom intercept, and γ = slope). We retained individual-level observations throughout and fit a fully disaggregate model on each group. We used the maximum likelihood estimation with the default Gauss-Newton algorithm via the nls procedure in the R statistical environment.

In support of the coders' classification, we find that for the curves classified as power law, Equation 1 fit the data better than Equation 2. To test whether curves classified as discontinuous were indeed fit better by Equation 2, we needed to obtain sufficient degrees of freedom for each comparison while minimizing issues due to averaging across participants. To this end, we pooled individual curves into groups according to the trial in which the abrupt drop was observed. We estimated Equations 1 and 2 on each group and found that across all model comparisons, the sigmoid equation fit the data better for discontinuous curves versus the power equation (Table 2). In support of H_2, we observed that 54% of the curves were discontinuous ($\chi^2 = 495.78$, $p < .001$), a proportion significantly greater than the null hypothesis of no discontinuous change.[1]

We tested H_3 by independently assessing type of learning (power law vs. discontinuous) and presence of insight and examining the correlation between these two variables. If insight is not positively correlated with discontinuous learning, H_3 is rejected. We tested H_3 by estimating a logistic regression model with the occurrence of insight as dependent variable, learning curve type (power vs. discontinuous) as predictor, and prior knowledge, technological anxiety, product category relevance, and need for closure as covariates. In support of H_3, we observed a significant main effect for curve type (Wald $\chi^2 = 4.3$, $p < .04$) such that discontinuous curves were positively related to the experience of insight. None of the covariates were statistically significant ($p > .2$).

TABLE 2
Model Comparisons (BIC)

A: Study 1

Curve Type	Power Model	Sigmoid Model	$d.f._{sigmoid}$
Discontinuity at Trial 2	1034.43	1027.75	99
Discontinuity at Trial 3	1873.7	1868.13	183
Discontinuity at Trial 4	814.25	807.44	81
Discontinuity at Trial 5	912.65	909.86	87
Discontinuity at Trial 6	421.4	419.66	39
Power law group	4548.65	4632.83	41

B. Study 2

Curve Type	Power Model	Sigmoid Model	$d.f._{sigmoid}$
Discontinuity at Trial 2	1178.94	1133.86	105
Discontinuity at Trial 3	1812.16	1807.51	147
Discontinuity at Trial 4	1069.09	1065.14	93
Discontinuity at Trial 5	204.97	203.57	15
Discontinuity at Trial 6	177.23	177.02	15
Power law group	5277.65	5371.78	489

B. Study 4

Curve Type	Power Model	Sigmoid Model	$d.f._{sigmoid}$
Discontinuity at Trial 2	167.29	165.78	15
Discontinuity at Trial 3	638.14	637.3	57
Discontinuity at Trial 4	317.18	314.56	27
Discontinuity at Trial 5	185.82	185.07	15
Discontinuity at Trial 6	32.92	32.65	3
Power law group	2933.51	2955.96	303

Notes: The two-parameter power models each have one greater degree of freedom than that reported for the three-parameter sigmoid models.

Discussion

The findings from this study provide evidence of a qualitatively different form of learning at the individual level. Although the power curve fit the aggregate data well and accounted for 97% of the variation in performance improvement, the fit overshadowed the existence of other forms of learning. When the same data were investigated at the individual level, we identified a significant number of learners (54% of our sample) who exhibited abrupt jumps in performance during their product usage. It is important to note that discontinuous and power law learners did not differ in terms of their eventual postlearning performance ($p > .5$). Thus, proficiency with using the product was no different between the learning paths, only the form of learning differed (for the empirical curves, see Figure 4).

Importantly, the logistic regression of the incidence of insight (culled from participant's cognitive responses) based on learning curve type (H_3) was significant, suggesting that differences in the form of learning are correlated with qualitatively different learning experiences. In particular, we find that those people who exhibited discontinuous performance gains also were more likely to form a mental model for how to use the product. This process, similar to the completion of a mental schema, should lead to the Aha! experience (cognitive insight, Schilling 2005). This

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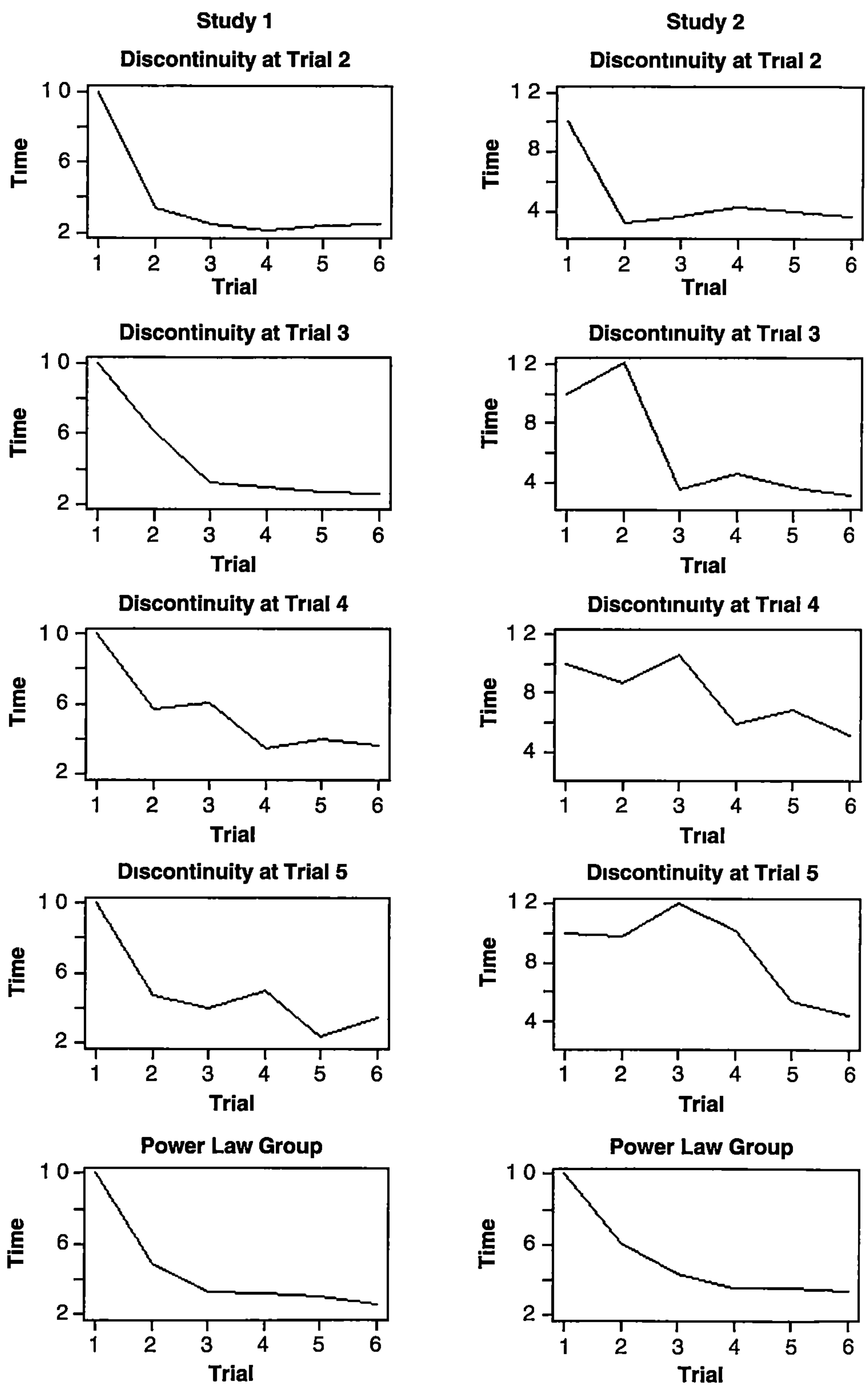
[1] A separate study (n = 78) independently replicated this finding with 30% of learners in that study evidencing discontinuous curves ($\chi^2 = 126.36$, $p < .001$). Model comparisons between the two learning curves for all groups were consistent with Study 1, attesting to the robustness of this empirical finding.

FIGURE 4
Empirical Curves



Notes The figures reflect average completion times by group and thus are not isomorphic with individual curves raises the question, Why should such an experience matter? The next study examines why discontinuous learning and insight may lead to unique consumer consequences, such as affect and product perceptions.

Study 2: Positive Consequences of Insight-Driven Learning

Our expectations regarding consumer perceptions stem from two characteristics of discontinuous learning. First, discontinuous learning is defined by abrupt improvements in performance, and second, experience of insight is more likely to accompany this form of learning. This Aha! experience should be more likely to positively affect the mood of the consumer on account of the "joy of learning." In other words, users who experience insight are likely to feel good about their learning experience. Furthermore, signal detection principles suggest that, in general, incremental changes are less likely to be noticed than abrupt ones. It is reasonable to expect that consumers who have a jump in learning (à la the discontinuous curve) would be more likely to notice their own improvement versus those whose gains are more incremental (the power law trend). Conversely, consumers whose performance improvement is more in line with the power curve are (1) less likely to experience insight and (2) less likely to notice their improved performance, thereby feeling less positive in general. Therefore, combining the preceding, we hypothesize the following:

H_4: (a) Users with discontinuous (vs. power law) learning exhibit greater positive affect, and (b) the effect of discontinuous learning on affect is mediated by insight.

Extensive research has shown that positive affect generated from an experience often transfers to another (even unrelated) context and has the potential to directly affect consumer decision making (Isen 2001). Thus, affect generated through insight should also transfer to the product. In this connection, because insight also corresponds with better understanding (Norman 2002; Schilling 2005), positive affect generated through discontinuous learning is accentuated. As a result of (1) the temporal proximity of the Aha! experience with product usage and (2) the direct connection between understanding generated through insight and product usage, the positive affect should be transferred to the product. In combination with greater clarity about the product and learning-driven positive affect, a person should develop stronger perceptions of the product's future usability. In turn, behavioral intentions pertaining to product use (Davis 1989) should be stronger for insight-driven learners. Formally,

H_5: Users who experience insight (vs. those who do not) during learning have greater usage intentions.

H_6: The effect of insight on usage intentions is mediated by affect.

Thus, Study 2 focuses on how insight is related to critical product adoption factors such as affect and future usage intentions, thereby enriching the technology adoption model (Dabholkar and Bagozzi 2002; Davis 1989) and adding to extant research on consumer judgments in skill-based product categories (Burson 2007).

Method

One hundred forty-seven undergraduate marketing students participated in the study in exchange for course credit. The overall method and procedure is similar to Study 1. A brief description of Audacity was shown to all participants, and a set of six identical tasks were administered. Completion times for all trials were collected unobtrusively, which was the basis for plotting the learning curves. Participants' affective state was measured immediately after the learning phase (and before dependent measures and covariates) using the positive and negative affect schedule (Watson, Clark, and Tellegen 1988).

The occurrence of insight during learning was coded following the protocol used in Study 1 (Krippendorff's $\alpha = .82$) from the cognitive responses. Usage intentions (three-item modified behavioral intentions scale), demographic variables, and other covariates—technological anxiety, relevance, and prior knowledge—were collected at the end of the session. As in the previous study, two independent coders categorized individual learning curves into discontinuous and power law curves. Intercoder agreement was high (Krippendorff's $\alpha = .84$), and disagreements were resolved by discussion. Curve fit analyses indicated that the coders' classification was robust (Table 2).

Results

Replication. Replicating H_1, the power law fit for aggregate learning curves was supported ($R^2_{Power} = .95$) and compared well with the benchmark linear regression ($R^2_{Linear} = .82$). In addition, replicating H_2, we observed that overall, 44% of the participants were discontinuous learners ($\chi^2 = 467.76$, $p < .001$). Moreover, replicating H_3, insight significantly and positively related to discontinuous learning curves (Wald $\chi^2 = 13.05$, $p < .001$).

Affect. To test H_4, we estimated a mediation model using the Preacher–Hayes bootstrapping procedure (Preacher and Hayes 2004) with discontinuous learning (yes/no) as the predictor, affect as the criterion, and insight (yes/no) as the mediator. We included final completion times and individual learning rates as control variables. In support of H_{4a}, the effect of discontinuous learning on affect (without mediating paths) was positive and significant ($t = 2.18$, $p < .03$). Furthermore, the effect of discontinuous learning on affect was fully mediated by insight. The bias-corrected 95% confidence interval of the IV → M → DV path did not include 0 (1.1595, 5.3156), and the direct effect of discontinuous learning on affect after removing the effect explained by the mediating path was not significant ($p > .3$). The effects for control variables were not significant ($p > .10$). These results support a fully mediated model of discontinuous learning leading to greater positive affect through the occurrence of insight (H_4).

Usage intentions. A regression with usage intentions as the criterion and insight as the predictor showed that insight significantly and positively predicted usage intentions ($\beta = .17$, $t = 2.02$, $p < .05$), lending support to H_5 (Table 3). We tested the mediation hypothesis (H_6) using the Preacher–Hayes procedure. In the model with insight

TABLE 3
Affect and Usage Intentions by Insight: Study 2

	Affect	Usage Intentions
Insight	4 23	7 55
No insight	−2 42	6 06

Notes Individual column comparisons of means were significantly different at the 05 level or less

leading to greater usage intentions through positive affect, the direct effect of insight on usage intentions was not significant (t = 54, $p > 5$), whereas the mediated path (insight → affect → intentions) was significant and positive (95% confidence interval 5002, 1 8607), indicating full mediation

Discussion

Study 2 replicates key findings from Study 1 and provides additional evidence in support of a qualitatively different form of learning insight-based learning An important substantive consequence of this alternative route is that the occurrence of insight leads to greater positive affect, which in turn influences consumer intentions critical to predicting successful usage adoption (Moreau and Dahl 2005, Shih and Venkatesh 2004, Wood and Moreau 2006)

Thus, in addition to providing evidence on the robustness of discontinuous learning, Study 2 also offers a fresh view of consumer-level drivers of usage adoption Notably, we find that insight-driven discontinuous learning during initial product trial has direct positive consequences for adoption beyond what might be expected from traditional power law learning Notably, these stronger intentions do not seem to arise out of any differences in proficiency but largely from the experience of insight Final completion times for insight-versus non-insight-driven learners did not differ, but behavioral intentions did

Thus, fostering discontinuous learning offers one way to enhance usage intentions Specifically, designing features or setting up initial trials to enhance the likelihood of an Aha! experience offers a new way to ensure that product adoption goes beyond purchase and extends into usage (Shih and Venkatesh 2004) Theoretically, the mediation results from this study directly contribute to enriching the technology adoption model (Dabholkar and Bagozzi 2002, Davis 1989, Meuter et al 2005) by highlighting the role of the type of learning in the product usage situation Given the possible impact of insight on product usage, we now turn our attention to antecedents of insight-based learning In Study 3, we lay out and test our expectations regarding the role of exploration in product usage

Study 3: Antecedents of Insight-Driven Learning

In Studies 1 and 2, we focused on outlining the different learning routes by analyzing completion time trends The broad theoretical basis for expecting discontinuous learning stems from the notion of discovery during initial product trial The experience of insight acts as a key driver affecting proficiency and perceptions Discovery-based learning predicates exploration as a factor facilitating learning (Yechiam, Erev, and Gopher 2001) and subsequent performance The underlying rationale is that because exploration encourages a more complete examination of the usage space, it should enhance the likelihood of discovering different (and possibly better) strategies in performing a task with the product, thereby fostering the experience of insight Consistent with this expectation, exploration should lead to broader learning and the development of a flexible knowledge base with regard to using a product In particular, as a person tries out different aspects of the product, he or she is more likely to acquire a deeper understanding of the product layout, product features, and how the features hang together, thereby enhancing his or her mental model of the product (Norman 2005) In contrast, low exploration during initial learning should limit the experience of insight and lead to limited how-to knowledge—notably, knowledge that is specific to the product usage task Thus, exploration (vs no exploration) during initial trial should lead to more flexible and generalizable knowledge (Taatgen et al 2008), which should be reflected in consumers' mental models Formally,

> H_7 Encouraging exploration during learning (vs not) leads to greater overall quality of consumers' mental models

The enhanced flexibility in knowledge gained along with greater effectiveness in using a product should be particularly evident in usage contexts in which prior knowledge is limited (Taatgen et al 2008) Transfer tasks present one such context A transfer task is one that is related to but different from the task initially performed Transfer contexts are especially relevant when considering products with multiple functionalities For example, people may initially learn different modes of image capture in a digital camera but, over time, may use different features (e g , various resolution settings, timer setup) How well consumers learn to use these related but previously unlearned features may strongly affect how much they eventually use the product and, in turn, how easily or quickly the product diffuses through the market (Shih and Venkatesh 2004)

Because exploration leads to more flexible and generalizable knowledge (Taatgen et al 2008), it should be well suited to improve performance in new usage contexts (i e , a transfer task) However, the overall beneficial effect of exploration on transfer task performance should be moderated by the type of task—in particular, its complexity When transfer task complexity is high, the steps involved in using the product should be more difficult to uncover and perform (than a low complexity task) With high exploration during learning, people are more likely to (1) make linkages between steps involved in using the product, (2) make connections between different features of the product and how they come together, and therefore (3) get a better overall sense—a more comprehensive mental model—of the product When faced with a complex transfer task, the availability of a good mental model should lead exploration-based learners to perform better than those not engaging in exploration during initial learning However, when the transfer task is not very complex, the steps involved are relatively easier to uncover and perform, thereby yielding no discernible advantage for the exploration-based learner (compared with those not engaged in exploration during learning) Thus

H_8 (a) Encouraging exploration during learning (vs not) leads to better transfer task performance, and (b) performance improvement is greater (less) when transfer task complexity is high (low)

In addition to experimentally manipulating exploration in Study 3, we recruited two new measures to assess the (1) quality of performance and (2) consumers' mental models generated during learning First, we devised a new transfer task in Study 3 to tap how well consumers are able to use a product This task generated unique participant-specific output, which could then be analyzed for performance quality Second, to measure the quality of insight generated during learning, we adapted the concept-mapping procedure developed by Novak and colleagues (e g , Novak 2002, Novak, Gowin, and Johansen 1983) This procedure calls on participants to generate a pictorial representation of the knowledge gained during product use and thus builds on the verbal protocol methods used in usability research We detail these procedures in the next section

Method

Study 3 used a 2 (learning type exploration vs no exploration) × 2 (transfer task complex vs simple) between-subjects full-factorial design with proficiency on a transfer task as the dependent measure Sixty-six undergraduate students completed the study in exchange for course credit We developed a new task involving Audacity and constructed objective measures derived from this task for performance assessment Specifically, we designed the task such that each participant produced a unique file whose acoustic quality could then be analyzed using the Audacity software The transfer task entailed converting a music file into a mobile phone ringtone, which is a relevant task for this sample (for details, see Part 2 of the Web Appendix at http //www marketingpower com/jmnov11) In essence, it involved trimming the music file to a suitable length (20 seconds) and boosting the lower (bass) frequencies of the music so that it sounds better on the smaller speakers usually found on cell phones After completing these steps, participants saved their output files and proceeded to the next section of the study We subsequently analyzed these individual files for (1) deviation from the ringtone length specified in the instructions and (2) amplitude of bass frequencies in the ringtone Using the acoustic analysis features in Audacity, an independent judge determined each participant's performance on these two dimensions from their unique output file

The exploration manipulation was administered by encouraging the participants in this group to "explore the product and try out its different features " We asked participants to rate the extent of exploration during their learning trials on a seven-point scale (1 = "did not play around," and 7 = "played around with the software"), and analyses revealed that participants in the exploration condition engaged in greater exploration than the no-exploration group ($M_{Explore} = 2\ 9$, $M_{No\text{-}Explore} = 2\ 3$, $p < 05$) We manipulated task complexity by introducing an additional step to the conversion task for the high-complexity condition Specifically, the additional step required participants to combine two parallel stereo tracks into one at the time of saving the output This step does not change the acoustic characteristics of the output file, which enabled us to have measures that are directly comparable across groups At the end of the study, we obtained complexity ratings for the transfer task on a seven-point scale (1 = "very simple," and 7 = "very complex") As we expected, participants rated the complex transfer task significantly more complex than the simple transfer task ($M_{complex} = 4\ 76$, $M_{simple} = 4\ 27$, $p < 05$)

Immediately after the learning trials, concept map measures were collected (Novak 2002) Participants drew a boxes-and-arrows diagram of their understanding of the product features and how the product is used to modify digital music Following the overall procedure outlined in Besterfield-Sacre et al (2004), two independent coders rated individual concept maps on a nine-point scale (1 = "low," and 9 = "high") across three dimensions correctness (reliability = 83), comprehensiveness (reliability = 87), and organization (reliability = 89) In particular, correctness was assessed by comparing the features and relationships between features described by the participant with the actual relationships and features derived from the product's description Coders judged comprehensiveness on the degree to which the participants' concept map covered the set of product features and actions/outcomes that could be ascertained through usage during the experimental task They judged organization according to the degree to which different concepts and relationships were logically interrelated in the map A summated score constructed from these items formed our measure of quality of insight (Cronbach's $\alpha = 91$)

The cover story and overall procedure was similar to previous studies, except the number of learning trials was reduced to three (because exploration was explicitly encouraged in this study) After the learning trials, the conceptual mapping measures, and a common filler task, participants completed the transfer task We also measured prior history, relevance, involvement, focused attention, and technological anxiety as covariates, and we report them in the analyses if significant

Results and Discussion

Quality of mental models We expected the mental models to be consistently better for the exploration (vs no-exploration) group A regression of the concept map scores on exploration revealed a main effect in the expected direction ($M_{Exp} = 16\ 76$ vs $M_{NoExp} = 14\ 98$, $t = 1\ 98$, $p < 05$), in support of the hypothesized impact of exploration on insight (H_7)

Performance Because the deviations from optimum ringtone length followed a Poisson distribution (most deviations close to 0 and a few extending to almost 70 seconds) we conducted a Poisson regression with amount of deviation (error length) as our dependent measure Exploration and type of transfer task served as the independent variables, with technological anxiety, involvement, attention, and prior history as covariates We observed a significant main effect for exploration ($z = 7\ 02$, $p < 001$) A significant two-way interaction ($z = 2\ 94$, $p < 001$) qualified this effect Planned contrasts revealed that the average error length was significantly lower for the exploration group for both the complex ($M_{Comp\_Exp} = 8\ 92$ seconds vs $M_{Comp\_NoExp} = 23\ 73$ seconds, $z = 7\ 02$, $p < 001$) as well as simple transfer tasks ($M_{Sim\_Exp} = 11\ 58$ seconds vs

$M_{\text{Sim\_NoExp}} = 22\ 49$ seconds, $z = 3\ 97$, $p < 001$) This difference was greater for the complex (vs simple) group, as indicated by the significant two-way interaction The effects of involvement and attention were negative (in the direction expected) and significant ($ps < 05$)

We also estimated a linear model with the two experimental manipulations as factors and the amplitude of bass frequencies in the ringtone as the dependent measure The coefficient for the main effect of exploration was positive and significant ($t = 3\ 2$, $p < 003$), and a significant two-way interaction qualified this effect ($t = 2\ 03$, $p < 05$) Planned contrasts showed that in the complex transfer task, exploration during learning led to significantly better quality (i e , higher relative volume of bass frequencies in the ringtone $M_{\text{Comp\_Exp}} = -37\ 57$ decibels vs $M_{\text{Comp\_NoExp}} = -49\ 1$ decibels, $t = 3\ 21$, $p < 003$), but in the simple transfer task, the difference was not significant ($M_{\text{Sim\_Exp}} = -36$ decibels vs $M_{\text{Sim\_NoExp}} = -42\ 38$ decibels, $t = 49$, $p > 5$) The effect of involvement was positive (in the direction expected) and significant ($p < 05$) Thus, across both measures, we find that exploration leads to better performance and that the improvement is greater for complex (vs simple) transfer tasks (H_8) Further exploration-based learning also led to greater usage intentions ($M_{\text{Exp}} = 4\ 69$ vs $M_{\text{NoExp}} = 4\ 00$, $t = 1\ 89$, $p = 06$)[2]

As the results of Study 3 indicate, encouraging exploration during initial product trial leads to the formation of a broader, more flexible mental model and enhances consumers' ability to use the product in different contexts Moreover, enhanced exploration seems to lead to greater behavioral intentions, similar to those observed in Study 2 as a result of insight This brings to the fore the issue of whether current practices in marketing are conducive for insight-driven learning We turn to this issue in Study 4

Study 4: Are Marketing Practices Conducive for Insight-Driven Learning?

Because consumer learning is critical to new product adoption, firms often engage in practices aimed at easing the process Providing step-by-step instructions is a common practice, and instruction manuals exemplify this approach Given that insight-based learning has positive effects on perceptions, it is important to understand whether current marketing practices with regard to instructions are conducive to fostering insight-driven learning

Although instruction manuals have advantages (Wright 1983), providing instructions to first-time users has also been shown to have no impact (Rettig 1991, Scharer 1983) or even reduce performance (Allwood 1990) Because tasks vary across studies, it becomes difficult to compare across these conflicting findings Therefore, analyzing usage learning and taking into account the type of learning might better explain these contradictory expectations

The assumption underlying the use of manuals is that the availability of instructions helps people learn the sequence of steps needed to use a product feature However, availability of instructions during actual product usage may encourage users to refer to them more often, thereby impeding active exploration In this connection, the exploration hypothesis posits that inadequate exploration leads to suboptimal usage strategies Allowing for sufficient trial and error with the feature will lead to optimal strategies and help performance Thus, providing usage instructions with the product (i e , before the consumer has explored the usage space) may lead to short-term performance benefits but is also likely to reduce the experience of insight during the initial trial by suppressing potential exploration (Yechiam, Erev, and Gopher 2001) In turn, this limits the individual-specific, discontinuous gains that are possible with exploration-driven learning Formally,

H_9 Providing usage instructions (vs no instructions) leads to (1) reduced exploration and (2) reduced likelihood of discontinuous learning

H_{10} The negative effect of instructions on discontinuous learning is mediated by exploration

Design and Procedure

Study 4 employed a single factor (instructions present vs absent) between-subjects design using the same overall experimental protocol as Studies 1 and 2 All participants were exposed once by computer to stepwise instructions on how to use the product to complete the experimental task Subsequently, these instructions were provided (not provided) as a printout to the instructions-present (instructions-absent) group and formed our instructions manipulation Data were collected on computers, and the experimental task involved using software (Audacity) to modify digital music We used a different task for this study introducing a fade-off effect to the music Instructions explicitly specified the feature to be used, and the steps needed to complete the task, as would be typical in a product usage manual

A set of six identical tasks (on differently named files) were administered, and completion times were measured unobtrusively, which formed the basis of the coding of two types of learning curves (intercoder reliability = 88)[3] Coders resolved disagreements by discussion This classification was also verified using the alternative model fits and found to be robust (Table 2) Participants' thought protocols were collected and coded for evidence of exploration (1 = "low," and 7 = "high", reliability = 81) during the experimental task Words or phrases such as "played around with," "fiddled around with," "tried out different things," and so on, were coded as evidence of high levels of exploration, and words or phrases suggesting that participants just repeated the basic steps were coded as low in exploration

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[2] The exploration and no-exploration groups did not differ in terms of attention, involvement, and motivation (all $ps > 25$) Furthermore, controlling for these factors, a one-way analysis of variance on the average time taken during learning trials revealed no significant effect for the exploration manipulation ($p > 2$), ruling out the alternative explanation that participants in the exploration group worked harder or paid greater attention to the product

[3] To verify the robustness of coder-based classification, we employed an objective, time-based criterion similar to autoregressive moving average modeling We defined a discontinuity when the drop in completion times between any two trials exceeded 150% of the average intertrial completion time drops for each participant This classification yielded results similar to the coders' and was in general agreement with it (percentage agreement across three studies ranged between 89% and 93%) The results of other analyses using this mathematically defined discontinuity were also consistent with current patterns and do not change the overall inference from our research

Results

Exploration and discontinuous learning Seventy-three undergraduate marketing students at a large midwestern university participated in the study in exchange for course credit We estimated a regression model with exploration as the dependent measure, presence (absence) of instructions as the factor, and involvement, motivation, and prior knowledge as covariates None of the covariates had significant effects and thus were excluded from further analyses The model revealed a significant, negative effect of instructions on exploration ($\beta = -43$, $t = 4\ 03$, $p < 001$), in support of H_{9a}

Similarly, we estimated a logistic regression with discontinuity in learning curves (yes/no) as dependent measure and instructions (present/absent) as the explanatory variable The model revealed a significant effect of instructions (Wald $\chi^2 = 5\ 11$, $p < 025$), and the parameter was negative, indicating that providing instructions reduced the likelihood of discontinuous learning, in support of H_{9b} Importantly, the relationship between exploration and discontinuity in learning curves was also supported A logistic regression on discontinuity with exploration as the predictor revealed a significant, positive effect of exploration on the likelihood of a discontinuous learning curve (Wald $\chi^2 = 4\ 45$, $p < 03$)

Mediation analysis We estimated a mediation model using the Preacher–Hayes bootstrapping procedure with discontinuity as the dependent variable, exploration as the mediator, and instructions as the predictor variable We observed that the total indirect path (IV → M → DV) was significant and the bias-corrected 95% confidence intervals of the indirect path did not include 0 (– 2283 to – 0087) The direct effect of instructions on learning curve discontinuity was not significant ($p > 10$) In combination, the results from this analysis support the fully mediated pattern of effects predicted in H_{10}[4]

Discussion

The results from Study 4 lend support to H_9 and H_{10}, the hypotheses outlining the effects of usage instructions on discontinuous learning Counter to lay expectations, we find that providing usage instructions, such as the step-by-step written instructions commonly found in user manuals, reduces discontinuous learning Availability of instructions during the initial trial process potentially leads new users to rely on them and, as a consequence, reduces exploration of the product In this sense, instructions become a prop (or even a security blanket) that deters users from trying out aspects of the product, in turn reducing the odds of discontinuous learning

These findings have important consequences for product adoption and the design and marketing of new products In particular, standard, user-manual-style written instructions seem to reduce the likelihood of insight-driven learning and thus the opportunity of greater positive affect and usage intentions that go with it Because firms deploy user manuals as an important aid in learning to use products, they often direct consumers to manuals at the first available opportunity for further guidance (the online equivalent being the "Help" files commonly found in software or websites) Our findings suggest that such practices might be counterproductive in some contexts and may need to be tempered when consumer-led or self-directed learning is of interest This research does not dispute the overall value of a readily available user manual and also notes that legal considerations often necessitate making one available to consumers However, our findings suggest that even with written instructions made available, actively encouraging exploration may help firms attain the benefits of insight-driven learning

General Discussion

This study's purpose is to develop and test a framework for how consumers learn to use products Table 4 summarizes the findings The core finding is the demonstration of

TABLE 4
Summary of Findings

Study	Hypothesis	Result
1	Power law fits better than linear trend for aggregate learning curves (H_1)	Supported
1	Discontinuous curves also present for individual learners (H_2)	Supported
1	Discontinuous learning more likely to relate to insight (H_3)	Supported
2	Discontinuous learning leads to positive affect (H_{4a})	Supported
2	Effect of discontinuous learning on affect mediated by insight (H_{4b})	Supported
2	Discontinuous learning correlates with greater usage intentions (H_5)	Supported
2	Effect of discontinuous learning upon usage intentions mediated by affect (H_6)	Supported
3	Exploration leads to higher quality of mental models (H_7)	Supported
3	Exploration leads to better transfer performance (H_{8a})	Supported
3	Effect of exploration on transfer performance is evident for more complex tasks but not less complex tasks (H_{8b})	Supported
4	Instructions reduce exploration (H_{9a})	Supported
4	Instructions reduce discontinuous learning (H_{9b})	Supported
4	Negative effect of instructions on discontinuous learning mediated by exploration (H_{10})	Supported

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[4] Comparisons between the instructions versus no-instructions group revealed no significant differences in terms of attention, involvement, motivation (all $ps > 5$), and average task times for learning trials ($p > 17$), thereby ruling out the alternative explanation that printed instructions served as a distraction

discontinuous learning and its connection to a qualitatively different learning mechanism: insight. In contrast to views of usage learning that conceptualize learning as a gradual process, discontinuous learning seems to be driven by an Aha! experience accompanied by abrupt jumps in skill. Enhanced likelihood of better conceptual learning through insight also seems to accompany this form of learning (Study 1). From the firm's standpoint, this route to learning offers the benefit of not only better consumer learning but also more favorable consumer perceptions and future intentions (Study 2). Given these positive effects, firms may foster this form of learning by structuring initial product trial to encourage exploration (Study 3). Firms can execute this concept in multiple ways. Structuring product tutorials that boost exploration and fostering in-store salesperson interactions that encourage consumers to explore are just a few such ways to secure the benefits of exploration and discontinuous learning. However, following the often-repeated process of giving step-by-step written instructions seems to diminish the incidence of insight-based learning (Study 4). Thus, the form of instruction and reliance on such instructions must be tempered with the odds of reducing the likelihood of an Aha! experience during learning.

Theoretical Implications

This research adds to theory on how consumers learn to use products. Our theoretical framework describes how learning to use products might follow different paths depending on the relative extent to which declarative and procedural knowledge interact during learning. This is a fertile area for further research because the form of interaction between declarative and procedural knowledge could vary substantially depending on context. For example, while this research shows one form in which insight occurs, other types of interaction such as top-down learning (declarative → procedural) or bottom-up learning (procedural → declarative) could lead to different consequences for product usage.

Further research could also examine other forms of insight and their role in consumer behavior. Whereas we examined one type of insight, the creativity literature also offers other diverse conceptualizations of insight (Schilling 2005) that may provide fodder for examining other contexts. A theoretically impactful area for further research might stem from a consideration of when alternative types of insight (e.g., insight via overcoming mental blocks, insight due to analogy) relate to product perceptions and usage.

Our research framework could also be used to seed new research on how consumers learn to use highly complex products. Do instructions and exploration play a similar role as they do in this study, or does their role change due to the complexity of the product? Furthermore, is insight as likely in such contexts, and what factors stimulate insight? On a related note, given the considerable attention devoted to incremental versus radical innovation (e.g., Chandy and Tellis 2000), a relevant question that prompts empirical research is whether insight is fundamentally related to learning to use radically new products.

The framework we have developed here might also be used to stimulate more sophisticated modeling approaches. For example, formally incorporating heterogeneity in curve parameters could enhance the discovery and modeling of individual differences in learning. In addition, hierarchical models (with Bayesian estimation) that predict learning types according to performance or latent class models classifying individuals according to learning trajectories could substantially enhance theory development in consumer learning.[5]

Finally, while extant research in marketing has identified procedural knowledge as a key component in preventing brand switching—variously recognized as human capital (Murray and Häubl 2007) and cognitive switching costs (Johnson, Bellman, and Lohse 2003; Wernerfelt 1985)—the route to achieving such capital has not been systematically studied. Our research fills this gap by developing theory on insight-driven learning. As the consumer either overcomes initial learning costs (power law) or derives benefits from initial learning (discontinuous learning), he or she develops procedural knowledge (in the form of user skills) that could eventually contribute to the development of tacit knowledge over time (Matthew and Sternberg 2009; Nickols 2000).[6] As immediate memory for the physical usage fades and the actual usage becomes habituated, proficiency with using a product might move into the domain of tacit knowledge, thereby adding to the human capital that the consumer has invested in the brand (Murray and Häubl 2007). Our research also suggests that insight-driven learning may indeed offer additional human capital by way of the positive emotion generated during initial learning.

Managerial Implications

With respect to consumers acquiring product usage knowledge, the predominant perspective guiding extant marketing thought and practice has been the learning-cost view. Viewed from this lens, initial trial represents a hurdle that consumers surmount to become proficient users. As a result, product design for consumer technology products has been dominated by ease-of-use concerns. Our research shows that initial trial also might present an opportunity to add value to the overall customer experience by enhancing the possibility of an Aha! experience. Experiencing an Aha! moment and forming a mental model for the product through insight could lead to positive affect and, consequently, product attachment. Therefore, it is important to acknowledge insight-based learning during use as an alternative to the ease-of-use mantra (e.g., "Geico. So easy a caveman can do it").

Indeed, in some situations, encouraging discontinuous learning might require consumers to deal with difficulty. For example, the TrackPoint (red button inside the keyboard) with which the Thinkpad line of laptops is strongly associated is not, at first glance, an easy-to-use and familiar interface. It involves using a small button embedded in the middle of the keyboard to navigate the on-screen cursor instead of a touchpad that most laptops feature. However, when a new customer "gets it," it acts as a veritable hook to enhance the usage experience and perceived satisfaction. Indeed, this specific feature has generated substantial customer involvement and attachment (Hill 2009) to the extent that it has now become part of the ThinkPad brand identity Notably, the ThinkPad logo sports the red button prominently (Hill 2007) This level of attachment to individual features is also evident with other firms' products For example, Apple has leveraged insight-driven consumer learning to successfully (re)introduce previously struggling platforms such as the tablet PC By positioning the iPad as an entertainment device and designing it such that users discover its features through actual trial, the tablet platform has been rejuvenated from the initial forays by Microsoft (Fontana 2010, Vilches 2010)

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[5] We thank an anonymous reviewer for this recommendation.

[6] We thank an anonymous reviewer for this insight.

Insight-driven learning offers a different route to salespeople's persuasion attempts, rooted in the notion of exploration and discovery Understanding how insight during initial trial might positively influence customer affect could provide a model for salespersons to encourage this process New customers may be explicitly encouraged to try out different product features, wherein the exploration is designed to lead them along the Aha! path This form of persuasion could help with not only short-term firm objectives (sales) stemming from positive affect but also long-term objectives (satisfaction, repeat purchase) This form of persuasion has been famously championed by Steve Jobs with his "one more thing" act at most Apple new product launches

Finally, because modern technologies direct customers toward making choices between platforms rather than choices between brands, it is even more important for firms to allow for and, wherever possible, enhance insight-driven learning The success of the motion-sensitive Wii platform has paved the way for Nintendo's subsequent cash flow from the games it sold on this platform Similarly, the success of the touch-screen interface allowed Apple to leverage it into a remarkably profitable platform suitable for different products Novel product design and new product trials that facilitate creativity, exploration, and discovery may offer ways for firms to encourage insight Competitions that engage consumers in using the product more effectively or in new ways (e g , "find ten uses for a Post-it Note") may help them explore the product space more fully and lead to an Aha! moment Actively engaging in social media and online forums can also expose consumers to insights from other sources—namely, existing customers Insight-based learning during initial product trial thus offers a readily accessible route to confer usage and affective benefits for the customer experience

Appendix

Subjective Knowledge (Items Anchored at 1 and 7)

As regards audio editor and recorder software, you are

1 "Not at all knowledgeable/highly knowledgeable"
2 "A complete beginner/an expert"
3 "Begun using recently/been using for a long time"
4 "Know much less than most people/know much more than most people"

Relative to the rest of the population's knowledge about audio editor and recorder software, you are

5 "One of the least knowledgeable people/one of the most knowledgeable people"

As regards computer software in general, you are

6 "Not at all knowledgeable/highly knowledgeable"

Technological Anxiety (Items Anchored at 1 = "Strongly Disagree," and 7 = "Strongly Agree")

1 In general, I feel apprehensive about using technology
2 Technical terms sound like confusing jargon to me
3 I have avoided technology because it is unfamiliar to me
4 I hesitate to use most forms of technology for fear of making mistakes I cannot correct

Product Category Relevance (Items Anchored at 1 and 7)

How do you rate the job that this product does in terms of its general significance to you as a consumer?

1 "Irrelevant/relevant"
2 "Unimportant/very important"
3 "Not applicable/highly applicable"

Involvement (Items Anchored at 1 and 7)

How do you rate the task that you performed during the experiment? To me, the task was

1 "Unexciting/exciting"
2 "Mundane/fascinating"
3 "Uninvolving/involving"
4 "Boring/interesting"

Focused Attention (Items Anchored at 1 and 7)

While using this software,

1 "I was not deeply engrossed/deeply engrossed"
2 "Not absorbed intently/absorbed intently"
3 "My attention was not focused/focused"
4 "I did not concentrate fully/concentrated fully"

Need for Cognitive Closure (Items Anchored at 1 = "Strongly Disagree," and 7 = "Strongly Agree")

1 I think that having clear rules and order at work is essential for success
2 Even after I've made up my mind about something, I am always eager to consider a different opinion
3 I don't like situations that are uncertain
4 I dislike questions which could be answered in many different ways
5 I like to have friends who are unpredictable
6 I find that a well ordered life with regular hours suits my temperament
7 I enjoy the uncertainty of going into a new situation without knowing what might happen
8 When dining out, I like to go to places where I have been before so that I know what to expect
9 I feel uncomfortable when I don't understand the reason why an event occurred in my life
10 I feel irritated when one person disagrees with what everyone else in a group believes
11 I hate to change my plans at the last minute
12 I would describe myself as indecisive
13 When I go shopping, I have difficulty deciding exactly what it is I want
14 When faced with a problem I usually see the one best solution very quickly

15 When I am confused about an important issue, I feel very upset

16 I tend to put off making important decisions until the last possible moment

17 I usually make important decisions quickly and confidently

18 I have never been late for an appointment or work

19 I think it is fun to change my plans at the last moment

20 My personal space is usually messy and disorganized

21 In most social conflicts, I can easily see which side is right and which is wrong

22 I have never known someone I did not like

23 I tend to struggle with most decisions

24 I believe orderliness and organization are among the most important characteristics of a good student

25 When considering most conflict situations, I can usually see how both sides could be right

26 I don't like to be with people who are capable of unexpected actions

27 I prefer to socialize with familiar friends because I know what to expect from them

28 I think that I would learn best in a class that lacks clearly stated objectives and requirements

29 When thinking about a problem, I consider as many different opinions on the issue as possible

30 I don't like to go into a situation without knowing what I can expect from it

31 I like to know what people are thinking all the time

32 I dislike it when a person's statement could mean many different things

33 It's annoying to listen to someone who cannot seem to make up his or her mind

34 I find that establishing a consistent routine enables me to enjoy life more

35 I enjoy having a clear and structured mode of life

36 I prefer interacting with people whose opinions are very different from my own

37 I like to have a plan for everything and a place for everything

38 I feel uncomfortable when someone's meaning or intention is unclear to me

39 I believe that one should never engage in leisure activities

40 When trying to solve a problem I often see so many possible options that it's confusing

41 I always see many possible solutions to problems I face

42 I'd rather know bad news than stay in a state of uncertainty

43 I feel that there is no such thing as an honest mistake

44 I do not usually consult many different options before forming my own view

45 I dislike unpredictable situations

46 I have never hurt another person's feelings

47 I dislike the routine aspects of my work

Positive and Negative Affect (PANAS) Scale (Items Anchored at 1 = "Very Slightly," and 7 = "Extremely")

The following are a number of words that describe different feelings and emotions Read each item and then check the appropriate button below that word Indicate to what extent you have felt this way during this experiment

> "interested," "distressed," "excited," "upset," "strong," "guilty," "scared," "hostile," "enthusiastic," "proud," "irritable," "alert," "ashamed," "inspired," "nervous," "determined," "attentive," "jittery," "active," "afraid"

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Sujay Dutta, Abhijit Biswas, & Dhruv Grewal

Regret from Postpurchase Discovery of Lower Market Prices: Do Price Refunds Help?

Consumer regret can result in unfavorable outcomes for marketers To prevent regret, many retailers promise to refund money to consumers who discover lower prices after purchase The authors show that a refund's effect on felt regret depends on how consumers view these promises If consumers mainly view them as protective tools (i e , adopt a protection focus), postrefund regret is minimal If consumers primarily view such promises as sources of information about the retailer's price status (i e , adopt an information focus), regret persists even after refund The authors show that regret persists with these consumers because finding a lower price results in a perception of trust violation They find that subject to boundary conditions, using a disclaimer that states that the retailer does not claim to offer the lowest prices helps avoid this negative outcome for information-focused consumers The authors contribute to the literature on outcome reversibility and regret by showing that outcome reversal does not necessarily obviate regret In addition, they show that regulatory focus serves as the motivational basis for how consumers view refund promises

Keywords regret, signal focus, regulatory focus, low-price guarantees, trust violation, message framing

Promising to refund money to customers who may find lower prices for the same or similar products is a widespread retailing phenomenon Researchers largely have viewed these promises, referred to as low-price guarantees (e g , Biswas, Dutta, and Pullig 2006), price-matching guarantees (e g , Kukar-Kinney and Walters 2003, Srivastava and Lurie 2001), or price-matching refund policies (Jain and Srivastava 2000), as signals of low prices In addition, these promises aim to prevent regret after consumers find a lower price in the market (McConnell et al 2000) Postpurchase regret might raise complaint intention while reducing satisfaction and repurchase intention (Tsiros and Mittal 2000), and marketers are adopting practices to obviate regret For example, a recently televised advertisement by Sears promised, "Real Time Price Checks! Next Day Delivery! No Regrets!" In this research, we investigate whether retail price refunds actually prevent consumer regret following their discovery of a lower price

Regret should be minimal if the negative outcome following a choice is reversed (e g , Engel, Blackwell, and Miniard 1995, Landman 1993) A possible negative outcome of choosing a retailer is the consumer's discovery of a lower price for the purchased product, leading to regret A price refund is meant to reverse this outcome, thereby reducing the consumer's regret However, in a pilot study, we find that refund has a limited impact on regret We argue that consumers' dominant view of a low-price signal (i e , their signal focus, Dutta, Biswas, and Grewal 2007) determines whether refund obviates their regret

Consumers might view a refund promise as a signal that the retailer offers the lowest prices (i e , information focus) or as a tool to protect them from fluctuating market prices (i e , protection focus) In Study 1, we measure respondents' signal focus and find that consumers who are predominantly information focused exhibit higher levels of regret and lower repurchase intention than those who are predominantly protection focused Recognizing that refunds do not obviate regret for information-focused consumers, we hypothesize that framing a price guarantee with a disclaimer that the retailer might not have the lowest prices might reduce their regret In Study 2, we directly manipulate signal focus and find that a disclaimer-based framing helps obviate postrefund regret in information-focused consumers Subsequently, we extend our understanding of the nature and role of signal focus In Study 3a, we demonstrate that regulatory focus (e g , Higgins 1997) serves as the motivational basis for signal focus, and in 3b, we vary respondents' signal focus by manipulating their regulatory focus and replicate the core findings of Study 2 Finally, in Study 4, we demonstrate a boundary condition to the efficacy of disclaimer-based framing We find that such a framing is less likely to obviate postrefund regret and

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raise repurchase intention when consumers perceive market prices as relatively stable In addition to contributing to the literature on market signals by demonstrating the role of signal focus in postpurchase outcomes and providing a conceptual foundation for the construct in regulatory focus theory, we contribute to the literature on regret by showing that when a sense of trust violation follows an undesirable outcome, regret might persist even after the outcome has been reversed

We organize the rest of the article as follows First, we develop a conceptual framework to address the question whether postrefund regret is likely to occur Second, we discuss the procedures and results of our four main studies Finally, we discuss our findings and the limitations of our research and offer directions for further research

Refund and Regret

A possible negative outcome of choosing to buy from a retailer is the postpurchase discovery that the same product is available for a lower price in the market, leading to feelings of regret Research on consumer choice of retailers indicates that consumers prefer retail offers with low-price guarantees to avoid this anticipated regret (McConnell et al 2000) This is because the monetary refund associated with a guarantee reverses the negative postdecisional outcome of finding a lower price, it should reduce feelings of regret However, does a refund necessarily obviate felt regret? We posit that regret persists after a refund if consumers believe that their trust in the low-price signal has been violated Furthermore, how consumers view such signals determines whether a sense of trust violation results following postpurchase discovery of lower prices

Whether outcome reversal reduces felt regret is an under-researched issue and one that is not straightforward (Gilbert and Ebert 2002, Roese and Summerville 2002, Zeelenberg and Pieters 2007) For example, Tsiros and Mittal (2000) find greater felt regret when decision makers act with the knowledge of a better forgone alternative than when they lack that knowledge, even when outcomes are reversible Moreover, a pilot study we conducted indicates that postrefund choice regret (i e , regret for having chosen to buy from the focal retailer) and search regret (i e , regret for not searching more before purchase) are not significantly lower and repurchase intention is not significantly higher than prerefund levels (choice regret $M_{prerefund} = 5\ 16$, $M_{postrefund} = 4\ 52$, $t_{49} = 1\ 58$, $p > \ 12$, search regret $M_{prerefund} = 5\ 48$, $M_{postrefund} = 5\ 04$, $t_{49} = 1\ 10$, $p > \ 28$, repurchase intention $M_{prerefund} = 3\ 73$, $M_{postrefund} = 4\ 23$, $t_{49} = 1\ 48$, $p > \ 14$) We posit that if consumers view price refund promises primarily as devices to protect them from market price fluctuations, a refund should lower regret However, if consumers primarily view them as sources of information about the retailers' price status, a refund does not obviate regret Next, we provide our rationale for this expectation

The Role of Signal Focus and Trust

Consumer research literature conceptualizes low-price guarantees as marketplace signals According to signaling theory, a seller's signal informs buyers about some attribute the seller possesses (e g , Kirmani and Rao 2000) If buyers do not have this information, they might perceive the exchange as too risky and thus avoid it (Grewal, Gotlieb, and Marmorstein 1994, Shimp and Bearden 1982) In this sense, the primary job of a low-price guarantee is to inform consumers that the retailer's prices are close to the lower end of the market spread of prices for a product category (e g , Biswas, Dutta, and Pullig 2006, Biswas et al 2002, Srivastava and Lurie 2001)

A signal is typically associated with a promise to recompense the receiver if the information it conveys turns out to be erroneous For example, the refund clause associated with a low-price guarantee promises to compensate the buyer if the offer price is not the lowest in the market This self-imposed penalty lends credibility to the information conveyed by the signal, with the reasoning that it is in the seller's best interest to provide true information to avoid the penalty (e g , Boulding and Kirmani 1993, Wernerfelt 1988) Thus, according to signaling theory, a signal's primary purpose is to inform, and the penalty associated with the signal makes that information credible In the case of a low-price guarantee, consumers infer that a retailer promising to refund money must be confident of its low prices because it does not make good business sense to offer refunds otherwise (e g , Jain and Srivastava 2000, Srivastava and Lurie 2001)

A price guarantee favorably affects buyers' overall perceptions of the retailer's prices, the offer value, and purchase intention (e g , Biswas et al 2002, Kukar-Kinney and Walters 2003, Srivastava and Lurie 2001), presumably because the guarantee indicates that the retailer has low prices However, researchers have recently posited that consumers vary in terms of how they view low-price signals and their primary reason for being attracted to them (Dutta, Biswas, and Grewal 2007) A price guarantee attracts consumers with an information focus mainly because it indicates that the signaling retailer is low priced In contrast, consumers with a protection focus prefer the guarantee because it promises to protect them from fluctuating market prices Although both foci might operate in a consumer, outcomes reflect the more dominant focus Thus, when consumers discover lower market prices after purchasing a product from a refund-promising retailer, they think more (less) unfavorably of the retailer if their information (protection) focus is dominant

We posit that postrefund regret persists in information-focused consumers because of a perception of trust violation In contrast, protection-focused consumers do not perceive trust violation and thus feel little regret Trust helps firms develop strong relationships with customers (e g , Chaudhury and Holbrook 2001, Garbarino and Johnson 1999), especially in a signaling context, because the signal is a source of information (Boulding and Kirmani 1993) To infer information about low prices from a price guarantee reliably, a consumer must trust the retailer Information-focused consumers, who strongly value and act on a signal's information, likely trust the retailer to provide accurate information, and postpurchase discovery of a lower price constitutes a violation of this trust On the basis of prior findings (e g , Lewicki and Bunker 1996, Morrison and Robinson 1997, Robinson 1996), Schoorman, Mayer, and Davis (2007, p 349) conclude that "violation of trust is likely to be an emotional event for the trustor" The sense of trust violation that follows postpurchase discovery of a lower price among information-focused consumers might lead to regret, with the likely reasoning that “If I had not chosen this retailer or had searched more, my trust would not have been violated” Thus, a refund reverses the outcome in terms of the final price paid, but an information-focused consumer experiences regret because of a violation of the very basis on which he or she trusted the signal (i e , the retailer's promised low priced status) This would seem to explain the high levels of pre- and postrefund regret we observed in the pilot study Protection-focused consumers are primarily attracted by the signal's promise of a refund, and perception of trust violation is not likely Therefore, these consumers should feel little regret following postpurchase discovery of lower market prices Stated formally,

> H_1 Consumers with relatively greater information focus versus protection focus experience (a) higher choice regret, (b) higher search regret, and (c) lower repurchase intention

In Study 1, we examine the effects of signal focus on choice and search regret In addition, we attempt to replicate the prior finding that the postrefund repurchase intention of information-focused consumers is lower than that of protection-focused consumers (Dutta, Biswas, and Grewal 2007) Finally, by measuring respondents' signal focus and categorizing them as predominantly information or protection focused according to that measurement, we examine the untested assumption that signal focus can be a chronic trait (Dutta, Biswas, and Grewal 2007), an issue of theoretical and practical importance

Study 1

Design and Procedure

Eighty-four undergraduate students (51 2% women) from a large midwestern U S university participated in this two-part study In the first part, participants received a brief description of three pricing practices, including low-price guarantees, and responded to some questions on about these tactics We wrote the price guarantee description carefully to avoid sensitizing participants to its informational versus protective role Then, participants responded to a six-item scale with three items for each type of signal focus (Dutta, Biswas, and Grewal 2007, for the items, see the Appendix) Half the participants saw the information-focus items first

We conducted the second part of the study after two days Participants imagined that they were considering the purchase of a digital camera and had come across a local retailer's advertisement for a model priced at $279 99 The advertisement stated a low-price guarantee with the slogan “Nobody Beats Our Prices—Guaranteed!” in bold at the top of the page At the bottom of the page, a text description outlined the refund conditions, the retailer promised to refund 120% of any price difference within 30 days of purchase The body of the advertisement contained information about the camera's attributes and price

After studying the advertisement, participants read a scenario asking them to imagine that they purchased the camera from the retailer after some searching Two days after purchase, they heard from a friend that a different store sold the same camera for $64 less, and when they approached the focal retailer for a refund, they received it as promised After reading the scenario, participants responded to a two-item scale for choice regret, a one-item measure of search regret, and a three-item scale for repurchase intention and then answered some demographic questions

Results

We categorized participants as predominantly information or protection focused by their scores on the respective scales Participants with higher scores on the summated information-focus scale belonged to the information-focus (IF) group, those with higher scores on the summated protection-focus scale belonged to the protection-focus (PF) group This procedure is consistent with those used in the regulatory focus literature, in which researchers have used the difference of scores on the two foci measures to categorize respondents into two groups to compare means (e g , Cesario, Grant, and Higgins 2004, Louro, Pieters, and Zeelenberg 2005) or to use the difference scores as continuous measures in regression analyses (e g , Leone, Perugini, and Bagozzi 2005, Molden et al 2009)

A principal components analysis with Varimax rotation revealed a two-factor solution, in which information-focus items loaded on one factor (loadings from 78 to 83) and protection-focus items loaded on the other (from 78 to 85) The scale reliabilities were adequate ($\alpha_{\text{info}} = 73$, $\alpha_{\text{protection}} = 75$, $\alpha_{\text{choice}} = 95$, $\alpha_{\text{repurchase}} = 96$) The order of presentation of the scales had no effect on the scores Information focus for the IF group was higher than that for the PF group ($M_{\text{IF info focus}} = 5\ 44$, $M_{\text{PF info focus}} = 4\ 28$, $t_{82} = 4\ 54$, $p < 001$), and protection focus of the PF group was higher than that for the IF group ($M_{\text{PF prot focus}} = 5\ 77$, $M_{\text{IF prot focus}} = 3\ 96$, $t_{82} = 6\ 96$, $p < 001$) Within the IF group, information focus was higher ($M_{\text{Info}} = 5\ 44$, $M_{\text{Prot}} = 3\ 96$, $t_{37} = 7\ 64$, $p < 001$), and within the PF group, protection focus was higher ($M_{\text{Prot}} = 5\ 77$, $M_{\text{Info}} = 4\ 28$, $t_{45} = 8\ 99$, $p < 001$) Thus, the participants were categorized appropriately

H_1 predicts outcomes according to respondents' dominant signal focus The results of a multivariate analysis of variance (MANOVA) indicate a significant multivariate effect of signal focus (Wilks' $\lambda = 52$, $F = 24\ 83$, $p < 001$) Consistent with H_1, the IF group exhibited higher choice regret ($M_{\text{IF}} = 4\ 42$, $M_{\text{PF}} = 2\ 16$, $t_{82} = 6\ 72$, $p < 001$) and search regret ($M_{\text{IF}} = 5\ 03$, $M_{\text{PF}} = 3\ 46$, $t_{82} = 3\ 74$, $p < 001$) than the PF group It also had lower repurchase intention ($M_{\text{IF}} = 3\ 33$, $M_{\text{PF}} = 5\ 70$, $t_{82} = 8\ 16$, $p < 001$) We obtained similar results when we regressed each dependent variable on the difference score (choice regret $R^2 = 41$, $F = 57\ 23$, $p < 001$, $\beta = 64$, search regret $R^2 = 15$, $F = 14\ 07$, $p < 001$, $\beta = 38$, repurchase intention $R^2 = 40$, $F = 53\ 57$, $p < 001$, $\beta = -63$)[1]

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[1] We retested H_1 with a median split of the respondents into two groups, high (low) information focus and low (high) protection focus As we expected, the high-information-focus respondents had higher choice regret ($M = 5\ 25$, $t_{36} = 6\ 11$, $p < 001$) and search regret ($M = 5\ 25$, $t_{36} = 2\ 31$, $p < 03$) and lower repurchase intention ($M = 2\ 97$, $t_{36} = 5\ 62$, $p < 001$) than the high-protection-focus respondents ($M_{\text{choice-regret}} = 2\ 42$, $M_{\text{search regret}} = 3\ 94$, $M_{\text{repurchase intention}} = 5\ 44$)

Discussion

The results of Study 1 confirm our expectation that even after receiving a refund, information-focused consumers experienced higher levels of regret and lower repurchase intention than protection-focused consumers These effects are of practical importance because they indicate a significant problem for retailers They also lead to an important conceptual question Why would postrefund regret persist in information-focused consumers? In other words, what theoretical mechanism drives this effect? Study 2 investigates whether framing of a price guarantee moderates the effects observed in Study 1 Incorporating framing into our design helps explain the theoretical mechanism behind the observed effects and also provides some guidance to retailers

Low-Price-Guarantee Framing

Study 1 indicates that retailers, even low-priced ones, are vulnerable to market price fluctuations because issuing a refund might not help them retain all their customers The turbulence that characterizes today's markets makes price fluctuations realistic, and even a well-intended low-price guarantee might not fully protect the retailer What can retailers do to protect themselves from such negative effects? We posit that the framing of a refund guarantee influences whether postrefund regret persists in information-focused consumers We argue that the perception of trust violation that follows postpurchase discovery of lower prices leads these consumers to experience feelings of regret Therefore, framing that makes trust less of an issue in the attractiveness of the signal should obviate the regret that information-focused consumers feel Study 2 tests this prediction

Low-price guarantees vary in their framing and structure (Arbatskaya, Hviid, and Shaffer 2004) The framing we used in Study 1 is common in the marketplace In this framing, the retailer explicitly promises a low price, with a statement such as "Nobody beats our prices" or "We offer the lowest prices on our products," and adds a refund clause to the statement Thus, this type of framing makes it explicit that the retailer is low priced In an alternative structure, a retailer might promise a refund without explicitly claiming low-price status (e g , The Great Indoors, as seen in their stores) We refer to this as an implicit guarantee, in which any hint about the retailer's low-priced status is implicit in the promise of a refund, as inferred by consumers In yet another structure, the retailer might state a disclaimer that it does not claim to be charging the lowest prices but will refund money to consumers if they find lower market prices We refer to this as a disclaimer-based guarantee We choose a disclaimer-based framing for both theoretical and practical considerations As we elaborate subsequently, we expect that a disclaimer-based framing makes information-related trust less of an issue in evaluating the signal Consequently, we expect any sense of trust violation, and thus felt regret, to be much lower for this framing, compared with explicit or implicit framing Thus, a disclaimer-based framing helps researchers better understand and assess the role of trust violation in felt regret From a practical standpoint, if disclaimer-based framing has the expected outcome, retailers can potentially use it as a protection against probable backlash following postpurchase discovery of lower prices

We posit that for explicit and implicit guarantees, perception of trust violation mediates the effect of signal focus on regret and repurchase intention Both explicit and implicit guarantees highlight, to varying degrees, the informational role of the signal Therefore, they should reinforce consumers' information focus, especially when such focus is dominant These consumers place a great deal of trust in the explicit or implicit information about the retailer's low-priced status Consequently, when they discover lower prices after purchase, they feel a sense of trust violation, leading to high levels of regret and low levels of repurchase intention that persist even after the refund In contrast, protection-focused consumers' trust in an explicit or implicit guarantee is not violated as long as they receive the refund, and thus they have minimal, if any, regret and high repurchase intention

In contrast, for a disclaimer-based guarantee, consumers' information focus loses its relevance as a decisional factor in retailer choice and the guarantee's attractiveness is exclusive to its protective function Thus, a disclaimer makes consumers' information focus, especially when it is dominant, somewhat irrelevant to assessing the signal This has two important consequences First, even information-focused consumers largely view a disclaimer-based guarantee as a protective tool[2] Second, the disclaimer essentially makes information-related trust less of an issue in evaluating the guarantee, thereby preventing any sense of postpurchase trust violation and, thus, regret Consequently, for information-focused consumers, a disclaimer-based guarantee should lead to lower levels of regret and higher levels of repurchase intention than an explicit or implicit guarantee For protection-focused consumers, a disclaimer-based guarantee should not have a different effect on regret and repurchase intention than an explicit or implicit guarantee Thus, we expect an interaction effect between signal focus and signal framing Stated formally,

> H_2 Signal focus and signal framing interact with respect to postrefund regret and repurchase intention When the consumer's information focus is relatively greater, a guarantee with a disclaimer leads to lower choice regret, lower search regret, and higher repurchase intention than an explicit or implicit guarantee This effect is absent when the consumer's protection focus is relatively greater

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[2] We do not expect consumers' general signal focus to change after they are exposed to a specific guarantee framing, but a specific framing (e g , with or without a disclaimer) might make consumers view the specific retailer as primarily motivated by an intention to protect (retailer-specific protection focus) or inform (retailer-specific information focus) When even information-focused consumers view a guarantee with a disclaimer, they might infer a largely protective motive and respond accordingly Thus, we expect consumers' cognition to be adapted to the specific retail offer, in line with Schwarz's (2006) situated cognition perspective We elaborate on this perspective in the "Discussion" section and provide support for this reasoning in our empirical studies

Study 2

Design and Procedure

We conducted a 2 (signal focus information, protection) × 3 (signal framing explicit, implicit, disclaimer) between-subjects experiment with 167 undergraduate students (42 5% women) from the business school of a large midwestern U S university We manipulated signal focus in the first part of the study and signal framing in the second part The two parts were ostensibly separated insofar as we referred to them as separate studies conducted by different researchers and administered them approximately two hours apart

In the first part of the study, participants read a fictitious article from *Consumer Reports* about retail pricing practices and were told that they would be asked about their opinion on these practices The article described two practices, reference pricing and odd pricing, each in approximately 100 words and the third, a low-price guarantee, in 141 words In the information-focus condition, the low-price guarantee description highlighted that retailers primarily offered such guarantees to inform consumers about their low-price status and that *Consumer Reports* had found that most consumers interpreted the guarantee in that manner In the protection-focus condition, the description highlighted that retailers primarily offered such guarantees to protect consumers from market price fluctuations and that *Consumer Reports* had found that most consumers interpreted the guarantee in that manner The article was identical in length across the two focus conditions (for the focus manipulation, see the Appendix) After reading the article, participants responded to some general questions about reference and odd pricing and then completed the six-item signal focus scale from Study 1 Finally, participants provided some demographic information

The second part of the study was similar to Study 1 Participants imagined that they were in the market for four all-season tires and, in their search, had come across a local retailer's advertisement The fictitious retailer's name (ABC Auto-Mart) appeared in large, bold font at the top, and the body of the advertisement had a picture of Zeon tires with information on product attributes and price ($319 99 for four tires, close to the midpoint of the price range for these tires in the local market) The framing manipulation appeared toward the bottom of the advertisement In the explicit condition, the guarantee statement "We guarantee that we offer the lowest prices on all our products" appeared, followed by the refund promise "If within 30 days of purchasing the [brand and model name] from us, you find another local store selling this model at a lower price, we will refund 120% of the price difference" The refund statement was the same across all conditions, but the guarantee statement, which is popular in the local market and online, is a variant of the one we used in Study 1 We selected it to be more inclusive in our coverage of the statements in the market The implicit framing contained all the elements of the explicit guarantee except for the guarantee statement, which was absent In the disclaimer-based framing, we replaced the guarantee statement with "We do not claim that we offer the lowest prices on our products However, " followed by the common refund statement stated previously A pretest indicated that this framing was perceived to be as realistic as the other two types of framing

After studying the advertisement, participants read a scenario about their purchase, their discovery of a lower price in the market (lower by $64), and receipt of the promised refund from the retailer Next, they responded to a questionnaire that contained several scales, including those for the dependent variables (choice regret, search regret, and repurchase intention) and scales to measure their focus related to the retailer's specific low-price guarantee (see the Appendix) We wanted to determine if they primarily regarded the retailer's promise as a means to inform or protect These measures were modified versions of our general focus scales and enabled us to test our reasoning that different signal framing differentially stimulates consumers' signal focus Participants also responded to a scale to assess their perceptions of trust violation Finally, they answered a manipulation check question and some demographic questions

Results

Preliminary analyses Six respondents failed the manipulation check question and were excluded from further analyses, resulting in 78 respondents in the information-focus condition and 83 in the protection-focus condition The scale reliabilities (Cronbach's α) were as follows information focus = 75, protection focus = 87, choice regret = 93, repurchase intention = 97, retailer-specific information focus = 84, retailer-specific protection focus = 90, and trust violation = 95 A principal components analysis of the signal focus items resulted in a two-factor Varimax rotated solution (cumulative variance explained = 74%), with loadings from 73 to 88 for information focus and from 88 to 90 for protection focus Thus, signal focus was manipulated and measured satisfactorily

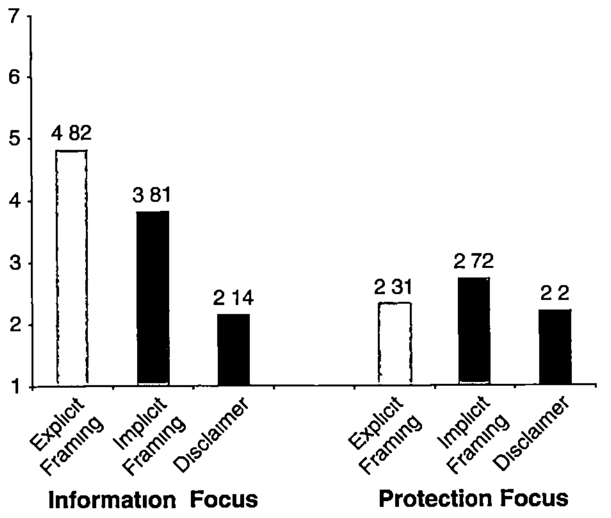
The IF group had a higher information focus (M = 4 89) than protection focus (M = 3 99, t_{78} = 3 83, $p <$ 001) In addition, the PF group had a higher protection focus (M = 5 23) than information focus (M = 4 19, t_{81} = 5 22, $p <$ 001) The IF group also had higher information focus (M = 4 89) and lower protection focus (M = 3 99) than the PF group (M = 4 19 and 5 23, respectively, t_{159} = 3 17, $p <$ 002, and t_{159} = 5 6, $p <$ 001, respectively)

Main analyses As we expected, choice regret was positively correlated with search regret, and the two regret measures were negatively correlated with repurchase intention (magnitudes of correlation coefficients range between 47 and 67, all *p*s < 001) The results of a MANOVA indicated a significant interaction effect (Wilks' λ = 89, F = 3 22, $p <$ 01) Similarly, the univariate interaction effect between signal focus and signal framing was significant for choice regret ($F_{2,155}$ = 8 58, $p <$ 001), search regret ($F_{2,155}$ = 3 81, $p <$ 02), and repurchase intention ($F_{2,155}$ = 4 41, $p <$ 01), in support of H_2 Figure 1 graphically displays the means

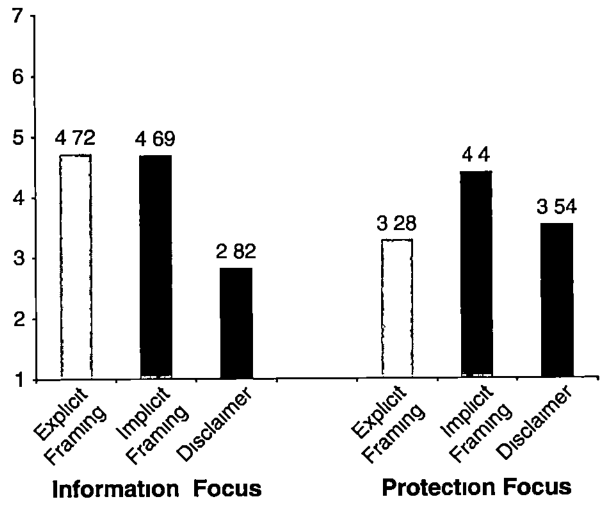
We conducted planned comparisons to investigate the pattern of interaction Framing influenced choice regret ($F_{2,76}$ = 14 94, $p <$ 001), search regret ($F_{2,76}$ = 8 82, $p <$ 001), and repurchase intention ($F_{2,76}$ = 7 75, $p <$ 001) in the information-focus condition Choice regret was greater for explicit framing (M = 4 82) than implicit framing (M = 3 81, t_{76} = 2 00, $p <$ 05), but neither search regret

FIGURE 1
Study 2 Pattern of Means

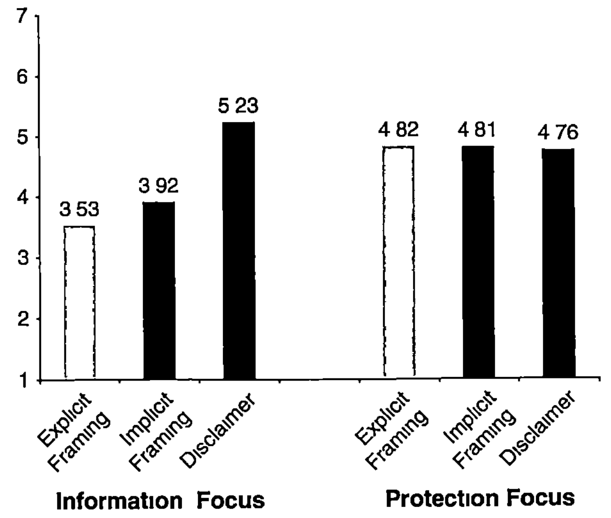
A: Choice Regret



B: Search Regret



C: Repurchase Intention



nor repurchase intention differed across explicit ($M_{search} =$ 4 72, $M_{repurchase} = 3\ 55$) and implicit framing ($M_{search} = 4\ 69$, $t_{76} =\ 05, p > \ 96$, $M_{repurchase} = 3\ 92$, $t_{76} =\ 82, p >\ 42$) As we expected, choice and search regret for explicit framing were greater and repurchase intention were lower than in the disclaimer condition ($M_{disclaimer\text{-}choice} = 2\ 14$, $t_{76} = 5\ 39, p <\ 001$, $M_{disclaimer\text{-}search} = 2\ 82$, $t_{76} = 3\ 62, p <\ 001$, $M_{disclaimer\text{-}repurchase} =$ 5 23, $t_{76} = 3\ 72$, $p <\ 001$) Finally, choice and search regret for implicit framing were higher and repurchase intention was lower than in the disclaimer condition ($t_{76} = 3\ 39$, $p <$ 001, $t_{76} = 3\ 60, p <\ 001$, $t_{76} = 2\ 91, p <\ 01$, respectively) In contrast, in the protection-focus condition, price guarantee framing had no effect on choice regret ($F_{2,79} =\ 98, p >\ 38$), search regret ($F_{2,79} = 1\ 93$, $p >\ 15$), or repurchase intention ($F_{2,79} =\ 01$, $p >\ 99$) Thus, the findings support H_2

Additional analyses We conducted additional analyses to replicate Study 1 findings and test our key theoretical assumptions As in Study 1, the main effects of signal focus on all the dependent variables were significant Specifically, choice and search regret were higher and repurchase intention was lower for explicit framing in the information-focus condition ($M_{choice} = 4\ 82$, $M_{search} = 4\ 72$, $M_{repurchase} = 3\ 55$) than in the protection-focus condition ($M_{choice} = 2\ 31$, $t_{52} =$ 5 92, $p <\ 001$, $M_{search} = 3\ 28$, $t_{52} = 2\ 81, p <\ 01$, $M_{repurchase} =$ 4 82, $t_{52} = 2\ 87$, $p <\ 01$) Similarly, for implicit framing, choice regret was higher and repurchase intention was lower in the information-focus condition ($M_{choice\text{-}info} = 3\ 81$, $M_{choice\text{-}prot} = 2\ 72$, $t_{49} = 2\ 20$, $p <\ 03$, $M_{repurchase\text{-}info} = 3\ 92$, $M_{repurchase\text{-}prot} = 4\ 81$, $t_{49} = 2\ 05$, $p <\ 05$) However, search regret did not differ across the signal-focus conditions for the implicit framing ($M_{search\text{-}info} = 4\ 69$, $M_{search\text{-}prot} = 4\ 40$, $t_{49} =\ 54$, $p >\ 59$) For the disclaimer-based guarantee, signal focus had no effect on choice regret ($M_{info} = 2\ 14$, $M_{protection} = 2\ 20$, $t_{54} =\ 13$, $p >\ 90$), search regret ($M_{info} =$ 2 82, $M_{protection} = 3\ 54$, $t_{54} = 1\ 17$, $p >\ 25$), or repurchase intention ($M_{info} = 5\ 23$, $M_{protection} = 4\ 76$, $t_{54} = 1\ 06, p >\ 30$) These results indicate the active role of information focus in determining postrefund outcomes for explicit and implicit signal framing

We assumed that for explicit and implicit framing, information-focused consumers would have a stronger perception of trust violation than protection-focused consumers Perceived trust violation was greater for information focus ($M = 4\ 87$) than for protection focus ($M = 2\ 74$, $t_{52} = 4\ 79$, $p <\ 001$) The effect for implicit framing was marginally significant ($M_{information} = 3\ 79$, $M_{protection} = 2\ 85$, $t_{49} = 1\ 9$, $p <\ 06$) Perception of trust violation did not differ across focus for the disclaimer-based guarantee ($M_{information} = 2\ 64$, $M_{protection} = 2\ 23$, $t_{54} = 1\ 10$, $p >\ 28$) Furthermore, trust violation mediated the effect of focus on choice and search regret First, focus had a main effect on choice and search regret Second, trust violation influenced choice regret ($R^2 =\ 47$, $F = 138\ 57$, $p <\ 001$, $\beta =\ 68$) and search regret ($R^2 =\ 19$, $F = 36\ 25$, $p <\ 001$, $\beta =\ 43$) Third, focus had a main effect on trust violation ($M_{information} = 3\ 73$, $M_{protection} = 2\ 60$, $t_{159} = 4\ 15$, $p <\ 001$) Finally, analyses of covariance revealed that the effect of focus on regret became statistically nonsignificant when we included trust violation as a covariate (choice regret $F_{1,158} = 2\ 83$, $p >\ 09$, search regret $F_{1,158} =\ 71$, $p >\ 40$)

We also tested our assumption regarding the effect of framing on perceptions of trust violation As we expected, framing influenced perceived trust violation in the information-focus condition ($F_{2,76} = 12\ 31$, $p < 001$) but not in the protection-focus condition ($F_{2,79} = 1\ 20$, $p > 31$) In the information-focus condition, both explicit and implicit framing led to higher levels of perceived trust violations than the disclaimer-based guarantee ($M_{explicit} = 4\ 87$, $M_{disclaimer} = 2\ 64$, $t_{76} = 4\ 95$, $p < 001$, $M_{implicit} = 3\ 79$, $t_{76} = 2\ 59$, $p < 001$)

Finally, we assumed that for information-focused respondents, a disclaimer-based guarantee would reduce their information focus toward the focal retailer Consistent with this assumption, we found that in the information-focus condition, framing influenced the retailer-specific information focus ($F_{2,76} = 9\ 83$, $p < 001$) and retailer-specific protection focus ($F_{2,76} = 4\ 23$, $p < 02$) Specifically, retailer-specific information focus was greater for the explicit ($M = 4\ 48$) and implicit ($M = 4\ 73$) guarantees than for the disclaimer-based guarantee ($M = 3\ 29$, $t_{76} = 3\ 38$, $p < 001$, $t_{76} = 4\ 13$, $p < 001$, respectively) Retailer-specific protection focus was greater for the guarantee with a disclaimer ($M = 5\ 48$) than for the explicit guarantee ($M = 4\ 37$, $t_{76} = 2\ 65$, $p < 01$) or implicit guarantee ($M = 4\ 53$, $t_{76} = 2\ 31$, $p < 02$) Therefore, for respondents in the information-focus condition, the disclaimer-based guarantee reduced their information focus and heightened their protection focus with respect to the focal retailer's promise, compared with the explicit and implicit guarantees

Discussion

Study 2 results confirm that postrefund regret persists in information-focused consumers because of a sense of trust violation A disclaimer-based framing can mitigate this effect by making trust less of an issue in the evaluation of the signal However, neither prior research nor our findings shed any light on the conceptual foundation of signal focus Where does signal focus come from? We conducted Studies 3a and 3b to test our proposition that signal focus is grounded in people's regulatory focus (Higgins 1997) and to replicate the core findings of Study 2 by manipulating respondents' regulatory focus, respectively These studies enable us to extend prior work on signal focus (Dutta, Biswas, and Grewal 2007) by providing a conceptual foundation for the construct

Motivational Bases of Signal Focus

Regulatory focus theory can explain the motivational bases of signal foci This theory posits that people's regulatory foci help them self-regulate their pursuit of behavioral goals by serving as motivational states that affect their feelings, thoughts, and actions (e g , Higgins 1997, 1999, 2002) Thus, people might have a promotion focus, whereby they pursue a goal by approaching desired states, or they might have a prevention focus, whereby they seek to avoid undesired end states Regulatory foci can be chronic to people while also being responsive to situational primes (e g , Grewal et al 2010, Shah and Higgins 1997) Particularly relevant to the present context is the proposition that regulatory focus can influence people's information processing (Aaker and Lee 2001, Florack, Scarabis, and Gosejohann 2005, Friedman and Forster 2001, Pham and Higgins 2005) For example, previous research has shown that regulatory focus affects consumers' sensitivity to an advertiser's manipulative intent, as inferred from cues in the advertisement (Kirmani and Zhu 2007) We posit that consumers' regulatory foci affect their processing of price guarantees such that dominance of promotion (prevention) focus leads to dominance of information (protection) focus

This expectation is consistent with the propositions and findings related to regulatory focus theory People are expected to emphasize aspects of a message that align with their dominant motivational states Thus, people with a predominant promotion focus would emphasize different aspects of a message than those with a predominant prevention focus (Pham and Higgins 2005) Promotion focus makes people seek accomplishments by reaching a desired end state and leads to a preference for information that facilitates advancement toward that end state (Higgins 2002, Pham and Higgins 2005, Safer 1998) In the context of a low-price guarantee, the prospect of paying the lowest price likely represents a desired end state for promotion-focused consumers, leading them to emphasize that aspect of the signal Moreover, a promotion focus leads to a heightened sensitivity to gains (Pham and Higgins 2005, Shah, Higgins, and Friedman 1998, Zhou and Pham 2004) The prospect of paying a lower price to the guarantee-issuing retailer compared with other retailers might seem like a gain to promotion-focused consumers, thereby attracting them to this aspect of the signal Therefore, a promotion focus should lead to an information focus

In contrast, a prevention focus makes people avoid an undesired end state, leading to a preference for security and protection (Higgins 2002, Pham and Higgins 2005, Safer 1998) Consequently, dominance of a prevention focus makes people sensitive to information related to risk or loss avoidance (Pham and Higgins 2005, Shah, Higgins, and Friedman 1998, Zhou and Pham 2004) Therefore, we expect people with a prevention focus to emphasize the refund statement because it ensures protection from possible future losses due to lower market prices Thus, a prevention focus is the motivational basis for a protection focus Study 3a examines the predicted relationship between regulatory and signal focus

Study 3a

Design and Procedure

Fifty-three students (45 3% women) from a large U S university were told that they would participate in small studies being conducted by multiple researchers We manipulated regulatory focus as Lockwood, Jordan, and Kunda (2002) and Sengupta and Zhou (2007) do Participants reported on how they dealt with their academic goals In the promotion-focus condition, participants were asked to think of a course that they were taking in the current semester and list two *positive* academic outcomes that they would like to *achieve* in that course Next, they were asked to describe the strategies that they could adopt to successfully *promote* those outcomes Participants in the prevention-focus condition were asked to think of a course that they were taking in the current semester and list two *negative* academic outcomes that they would like to *avoid* in that course. Next, they were asked to describe the strategies that they could adopt to successfully *prevent* those outcomes.

Participants then proceeded to a "personality" study in which they selected three of six choices to indicate their primary strategies for being a good friend. The first three of these choices aligned with promotion focus, and the rest aligned with prevention focus. Previous research has used this approach to test different manipulations of regulatory focus (Higgins et al. 1994; Sengupta and Zhou 2007; Zhou and Pham 2004). Finally, the respondents participated in a "retailing" study in which they provided their opinions about low-price guarantees by responding to the six-item signal focus scale we used in Study 2. We expected participants in the promotion-focus condition to be more information focused and those in the prevention-focus condition to be protection focused. At the end, participants provided some demographic information.

Results

In support of our regulatory focus manipulation, the promotion-focus condition revealed means of 1.96 for the promotion-related items and 1.04 for the prevention-related items on the "friendship strategy" choices ($t_{26} = 5.51$, $p < .001$). In contrast, the prevention-focus condition revealed means of 2.08 for the prevention-related choices and .92 for the promotion-related choices ($t_{25} = 6.08$, $p < .001$).

The reliabilities (Cronbach's α) for information-focus and protection-focus scales in the "retailing" study were .72 and .86, respectively. A principal components analysis of these scale items resulted in a two-factor Varimax rotated solution (cumulative variance explained = 72.1%), with loadings from .81 to .89 for information focus and from .67 to .92 for protection focus. As we expected, in the promotion-focus condition, information focus (M = 5.25) was greater than protection focus (M = 3.69, $t_{26} = 7.09$, $p < .001$); in the prevention-focus condition, protection focus (M = 5.33) was greater than information focus (M = 3.47, $t_{25} = 4.80$, $p < .001$). Participants in the promotion-focus condition also had a greater information focus (M = 5.25) and a lower protection focus (M = 3.69) than those in the prevention-focus condition (M = 3.47 and 5.33, respectively; $t_{51} = 6.90$, $p < .001$, and $t_{51} = 5.45$, $p < .001$, respectively). These results show that regulatory focus serves as the motivational basis for signal focus. Next, we replicate the core findings of Study 2 using this theoretical premise.

Study 3b

Design and Procedure

We conducted a 2 (regulatory focus: promotion, prevention) × 2 (signal framing: explicit, disclaimer) between-subjects experiment with 119 undergraduate students (43.7% women) from a large U.S. university. The study was conducted in two parts, and respondents were told that they were participating in two separate studies. In the first part, we manipulated regulatory focus and included the manipulation check measures from Study 3a. The second part was conducted about 30 minutes later and was identical to that of Study 2, except for four differences. First, we used only two signal-framing conditions (explicit and disclaimer). Second, we asked respondents to report their thoughts after reading the scenario describing postpurchase discovery of lower price followed by refund. We wanted to determine whether these thoughts were consistent with an assumption we made in Study 2, namely, that a disclaimer suppresses negative thoughts in information-focused consumers. Third, we added one item to the choice regret scale and two items to the search regret scale to avoid concerns that our previous scales might be sparse. Fourth, we measured participants' general signal focus in the second part of the study only, in addition to measuring respondents' retailer-specific signal focus. We did this to help reinforce the notion that the two parts of the study were indeed separate. Moreover, this helped us test our assumption that framing affects consumers' retailer-specific focus but not their general focus.

Results

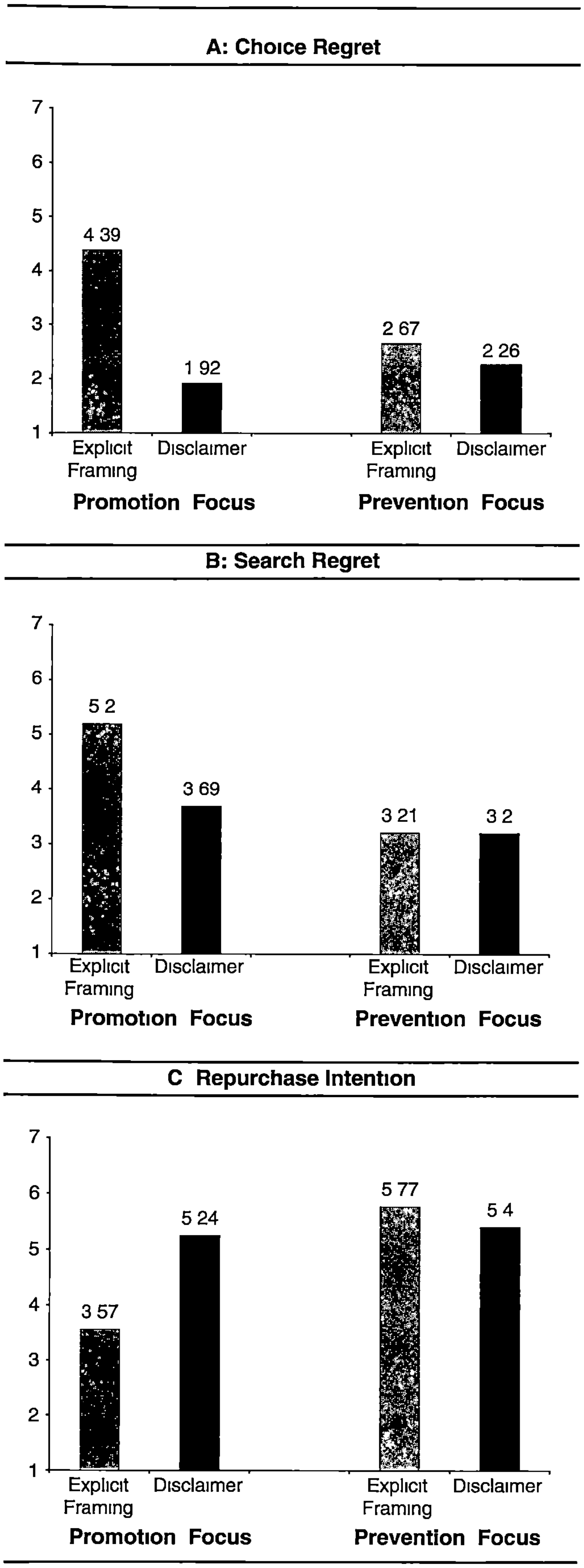
Preliminary analyses. We excluded five respondents from further analyses for failing the ad manipulation check, leaving 56 in the promotion-focus condition and 58 in the prevention-focus condition. As in Study 3a, the regulatory focus manipulation was successful. The scale reliabilities ranged from .77 to .96, and the factor solution for the signal focus scales was adequate. Furthermore, regulatory focus affected signal focus as expected, and this effect did not differ across the two types of framing. Thus, respondents were predominantly information focused (protection focused) in the promotion (prevention) condition. We discuss the rest of the results in terms of respondents' signal focus.

Main analyses. Our MANOVA indicated a significant interaction between signal focus and framing (Wilks' $\lambda = .84$, $F = 7.05$, $p < .001$). In addition, in support of H_2, the univariate interactions were significant (choice regret $F_{1,110} = 13.80$, $p < .001$; search regret $F_{1,110} = 4.62$, $p < .03$; and repurchase intention $F_{1,110} = 17.59$, $p < .001$). Figure 2 displays the pattern of means.

As we expected, in the information-focus condition, choice and search regret were higher ($M_{\text{explicit-choice}} = 4.39$, $M_{\text{explicit-search}} = 5.20$), and repurchase intention was lower for explicit framing ($M_{\text{explicit-repurchase}} = 3.57$) than for disclaimer-based framing ($M_{\text{disclaimer-choice}} = 1.92$, $t_{54} = 6.70$, $p < .001$; $M_{\text{disclaimer-search}} = 3.69$, $t_{54} = 3.15$, $p < .01$; $M_{\text{disclaimer-repurchase}} = 5.24$, $t_{54} = 4.89$, $p < .001$). However, in the protection-focus condition, framing had no effect on choice regret ($t_{56} = 1.00$, $p > .32$), search regret ($t_{56} = .03$, $p > .98$), or repurchase intention ($t_{56} = 1.07$, $p > .29$).

Two independent judges who were not aware of the hypotheses coded participants' thoughts into five categories: negative comments about the low-price guarantee, negative comments about the store, positive comments about the store, positive comments about the low-price guarantee, and other comments. Interrater reliability (Perreault and Leigh 1989) was .92, and the raters resolved disagreements through discussion. Overall, the thought data reflected our theoretical expectation. Negative comments about the low-price guarantee or the store stemmed largely from a sense of betrayal (e.g., "ABC Auto mart did not have the lowest prices. . . . I would have bad feelings because I'd feel that ABC lied to me"). However, positive comments largely reflected appreciation for earning the promised refund (e.g., "I am extremely pleased that

FIGURE 2
Study 3b Pattern of Means



Automart honored their LPG and refunded me not only what the lower price was in another store but the extra 20% also") In addition, respondents seemed to appreciate the honesty reflected in the disclaimer-based framing (e g , "ABC did as promised ABC did not hassle me ABC did not advertise that they had the lowest prices, but did offer to match or beat any competitor price")

Overall, information-focused respondents had more negative thoughts in the explicit framing condition ($M = 1\ 35$) than in the disclaimer condition ($M = \ 19$, $t_{55} = 4\ 45$, $p <\ 001$) In addition, these respondents had more positive thoughts in the disclaimer-based framing condition ($M = 1\ 46$) than in the explicit framing condition ($M = \ 74$, $t_{55} = 2\ 83$, $p <\ 01$) However, framing had no effect on the negative thoughts of the protection-focused respondents ($M_{explicit} = \ 21$, $M_{disclaimer} = \ 23$, $t_{56} = \ 11$, $p >\ 92$) or on their positive thoughts ($M_{explicit} = 1\ 64$, $M_{disclaimer} = 1\ 67$, $t_{56} = \ 08$, $p >\ 94$) Thus, the thought data support our assumptions about the effects of framing

Additional analyses As we expected for the explicit framing, perceived trust violation was greater when information focus was dominant ($M = 5\ 31$) than when protection focus was dominant ($M = 2\ 50$, $t_{56} = 7\ 54$, $p <\ 001$) Perceptions of trust violation did not differ across signal focus for the disclaimer-based guarantee ($M_{information} = 2\ 60$, $M_{protection} = 2\ 31$, $t_{54} = \ 67$, $p >\ 51$) In addition, as in Study 2, an analysis of covariance conducted after confirming the prerequisite effects for mediation testing showed that trust violation mediated the effect of focus on choice and search regret (choice regret $F_{1,111} = \ 81$, $p >\ 37$, search regret $F_{1,111} = 1\ 49$, $p >\ 23$)

We assumed that for information-focused respondents, a disclaimer-based guarantee would reduce (raise) their retailer-specific information (protection) focus but would not affect their general signal focus Consistent with this assumption, a retailer-specific information focus was greater for the explicit guarantee ($M = 4\ 91$) than for the disclaimer-based guarantee ($M = 3\ 65$, $t_{54} = 3\ 46$, $p <\ 001$) when information focus was dominant Furthermore, for this group, retailer-specific protection focus was higher for the disclaimer-based guarantee ($M = 5\ 96$) than for the explicit guarantee ($M = 4\ 13$, $t_{54} = 4\ 95$, $p <\ 001$) In addition, as we expected, framing had no effect on these respondents' general information focus ($M_{explicit} = 5\ 02$, $M_{disclaimer} = 5\ 21$, $t_{54} = \ 64$, $p >\ 53$) or protection focus ($M_{explicit} = 4\ 14$, $M_{disclaimer} = 4\ 15$, $t_{54} = \ 02$, $p >\ 98$)

While the results of Studies 2 and 3b show that a disclaimer can have beneficial postpurchase effects, we attempted to identify a boundary condition for its effectiveness We posit that consumers' perception of the intensity of market price fluctuation limits the effectiveness of a disclaimer and conduct an additional study to test this proposition

Study 4: When Might Disclaimers Not Work?

Consumers might not take a disclaimer at face value when they have negatively valenced attributions about the retailer's motive in using the disclaimer In particular, a disclaimer might not be effective if consumers suspect opportunistic signaling following postpurchase discovery of lower prices. Although not demonstrated, perceptions of opportunistic signaling have been believed to play a role in postpurchase outcomes (Dutta, Biswas, and Grewal 2007).

We expect perceptions of market price fluctuation to limit a disclaimer's effectiveness by triggering suspicion of opportunistic signaling among information-focused consumers but not among protection-focused ones. When information-focused consumers perceive market prices for a product to fluctuate little, finding a lower price after purchase might lead them to suspect that the retailer did not provide the disclaimer with the best of intentions. This is because the lower price cannot be readily attributed to price fluctuation, indicating that the retailer never intended to offer a low price. Thus, consumers might believe that the disclaimer is a ruse, the primary purposes of which are to attract them and create plausible deniability in case they find lower prices. Because these consumers care a great deal about the information in a signal, these thoughts might cause them to regret choosing a retailer who might have signaled irresponsibly. When these consumers expect prices to fluctuate a great deal, they are less likely to suspect opportunistic use of the disclaimer because they can more plausibly attribute postpurchase discovery of lower prices to market price uncertainty. Protection-focused consumers mainly care about monetary protection. Given their lower sensitivity to the signal's informational component, they are not swayed by conditions that might indicate opportunistic signaling to information-focused consumers. Therefore, we expect an interaction effect between signal focus and perceived price fluctuation such that signal focus has no effect on choice regret, search regret, and repurchase intention when perceived price fluctuation is high. However, when price fluctuation is low, information focus leads to higher regret and lower repurchase intention than protection focus. We conducted a study to verify this expectation.

Study Description and Results

Eighty participants took part in a 2 (signal focus: information, protection) × 2 (perceived price fluctuation: low, high) between-subjects experiment that was conducted in two parts, similar to Study 2. In Part 1, we manipulated signal focus as in Study 2 (i.e., through an article, ostensibly from *Consumer Reports*). Participants were provided with price fluctuation information on four products in another ostensible *Consumer Reports* article that intended to inform consumers about market prices. The article stated that *Consumer Reports* had conducted a study in which it rated the intensity of short-term market price fluctuation for four products with a three-point scale ranging from "fluctuate a little" to "fluctuate a lot." Prices of car tires, the product used in Part 2 of the study, were shown to fluctuate a little or a lot, depending on the manipulated condition. Part 2 of the study, conducted two days after the first part, was identical to that of Study 2, but only the disclaimer-based framing was used. In addition to measuring the dependent variables, we assessed respondents' perception of opportunistic signaling with three items (see the Appendix).

The manipulation of signal focus worked as intended, and all respondents passed the manipulation check on perceived price fluctuation. In addition, all scale reliabilities were above .81. As we expected, the interaction effect between signal focus and perceived price fluctuation was significant for choice regret ($F_{1,75} = 9.50$, $p < .01$), search regret ($F_{1,75} = 4.42$, $p < .04$), and repurchase intention ($F_{1,76} = 5.60$, $p < .02$). Signal focus had no effect on these variables when perceived price fluctuation was high (all $ps > .42$). When fluctuation was low, information focus led to greater choice regret ($M = 3.92$), greater search regret ($M = 4.83$), and lower repurchase intention ($M = 4.33$) than protection focus ($M_{\text{choice regret}} = 2.25$, $t_{37} = 3.64$, $p < .001$, $M_{\text{search regret}} = 3.04$, $t_{37} = 4.01$, $p < .001$, $M_{\text{repurchase intention}} = 5.39$, $t_{37} = 2.86$, $p < .01$). Furthermore, perceived signal opportunism did not vary across focus for high price fluctuation ($M_{IF} = 2.41$, $M_{PF} = 2.70$, $t_{39} = .57$, $p > .57$). However, information focus led to greater perceived signal opportunism ($M = 4.60$) than protection focus ($M = 2.61$, $t_{37} = 4.11$, $p < .001$) when perceived price fluctuation was low. These results indicate that perceived intensity of price fluctuation can limit the postpurchase effectiveness of disclaimer-based framing. In the next section, we discuss our findings across the four studies.

General Discussion

Product and price signals from marketers have a significant impact on customer purchase and repurchase behaviors. In this article, we examine whether monetary retail refunds associated with low-price signals help prevent consumers' regret after they discover lower prices for purchased products. Our contribution is related to three major domains of research—regret, the role of signal focus and framing in postpurchase effects of low-price guarantees, and consumers' motivational foci. We make a theoretical contribution by demonstrating that the role of outcome reversibility in postdecisional regret is anything but intuitive (Tsiros and Mittal 2000). Price refunds associated with low-price guarantees are meant to reverse a possible negative outcome of choosing to buy from a retailer—namely, discovering lower market prices after purchase. According to prior research (e.g., Estelami, Grewal, and Roggeveen 2007; McConnell et al. 2000), we would expect that honoring low-price guarantees by issuing refunds would reduce postpurchase regret related to the choice of the retailer and regret for not searching enough for a lower price. We draw on research on trust from the marketing and organizational behavior literature to argue and demonstrate that when regret ensues from a perception of trust violation, it might not be mitigated by outcome reversal. We show that the extent of perceived trust violation depends on how consumers view a low-price signal and how the signal is framed. Finally, we demonstrate that regulatory focus acts as the motivational basis for how consumers view such signals.

Contributions and Implications

Our findings indicate that whether price refunds obviate regret after consumers find lower market prices for a purchased product depends on how the consumers view the refund promise. Consumers who primarily regard such promises as signals designed to inform them about the retailer's price status will experience greater regret due to perceived trust violation than those who primarily view the signals as protective devices. Thus, our findings strengthen the claim that consumers' dominant conceptualization of price guarantees affects outcomes of their discovery of lower market prices after purchase (Dutta, Biswas, and Grewal 2007).

We demonstrate that people's regulatory focus, which can be chronic or situational (e.g., Higgins 1997, 1999), serves as the motivational basis for their signal focus. Thus, people with a predominant promotion (prevention) focus have a predominant information (protection) focus. This provides a theoretical basis for our expectation and finding that, like regulatory focus, signal focus is a trait that also adapts to situations.

We show the importance of price guarantee framing in neutralizing probable negative postrefund outcomes for information-focused consumers. In Studies 2 and 3b, information-focused consumers viewed a disclaimer-based guarantee in a more protective light, and this prevented any regret they otherwise would have experienced following their discovery of a lower price after purchase. However, their general signal focus dominated outcomes when the guarantee explicitly or implicitly claimed a low-price status. It seems that depending on the situation, consumers determine, perhaps nonconsciously, whether their general signal focus is instrumental in evaluating a specific offer. Subsequently, they may use this general focus to evaluate the offer (as for an explicit or implicit framing) or may not use it (as for a disclaimer-based framing). Moreover, if necessary, information-focused consumers adapt their focus to the specific signal framing, as we found in case of the disclaimer-based guarantee in which their retailer-specific signal focus was dominantly protection oriented. However, this does not mean that consumers' general focus is not useful, only that it adapts to a specific situation. Thus, although consumers might adapt their focus to a specific framing on one occasion, they are expected to approach future retail offers with their usual general focus, unless the situation demands otherwise. These expectations and effects are supported by Schwarz's (2006) situated cognition perspective, in which human cognition is viewed to serve instrumental roles in facilitating people's interactions with the world and, thus, is highly adaptive to specific contexts.

Having demonstrated that a disclaimer-based framing might effectively prevent regret in information-focused consumers, we provide some evidence that a disclaimer's efficacy is subject to boundary conditions (Study 4). We find that when information-focused consumers discover lower prices after purchase and are also aware that market prices fluctuate little, they feel greater postrefund regret and lower repurchase intentions than protection-focused consumers. Our results indicate that information-focused consumers attribute postpurchase lower price to market price fluctuation when its perceived intensity is high but attribute it to possible opportunistic use of the disclaimer when they perceive market prices as more stable. In this context, opportunistic use occurs when a retailer uses a disclaimer largely as a ruse to attract consumers, with little genuine concern for protecting them.

We make an important theoretical contribution by demonstrating the pivotal role of trust in shaping postpurchase outcomes related to low-price signals. Because trust is essential for favorable prepurchase consumer response to signals, we can expect that perception of a violation of that trust would lead to undesirable consequences. Thus, if a signal is defaulted (i.e., the information it purported to convey turns out to be erroneous; Kirmani and Rao 2000), undesirable consequences might follow if consumers believe that their trust in the signal has been violated. For price guarantees, we demonstrate that perceptions of trust violation occur only for consumers who largely view those guarantees as sources of information about the retailer's price status, not for those who primarily perceive them as protective tools. Consequently, information-focused consumers, but not protection-focused ones, feel postrefund regret. The exact nature of trust violation felt by information-focused consumers depends on how the signal is framed. For explicit and implicit framing, perception of trust violation occurs because information-focused consumers strongly expect these signals to indicate low prices, and a postpurchase discovery of a lower price violates that expectation. Although a disclaimer-based framing can potentially protect from trust violation in this sense, such framing can become questionable if its opportunistic use is suspected, as occurs when these consumers perceive market prices as stable. To the extent that consumers expect honest use of a signal, opportunistic signaling constitutes violation of trust in a sense. We note a subtle possibility in this regard. Trust likely matters to protection-focused consumers as well, but for them, the trust is related to the promise of refund. As long as the retailer fulfills that promise, a perception of trust violation is not likely. The experimental scenarios we used described a smooth, hassle-free refund process. We expect undesirable outcomes for even protection-focused consumers if their refund experience is unpleasant.

Consumer trust is pivotal to retail success, and consumer mistrust can be deleterious to retailers (Goodstein 1994). Importantly for managers, our findings indicate that retailers are not entirely protected, even when they issue refunds without procedural hassles. Some consumers would experience regret even after receiving a refund, primarily because of a sense of trust violation. We used a guarantee that promised to refund 120% of the price difference; the observed effects might be stronger for higher refund levels. However, retailers can potentially circumvent these undesirable postpurchase effects relatively inexpensively, by providing a disclaimer along with the refund statement. Such a disclaimer can help prevent regret, even among consumers who primarily view a price guarantee as a signal of the retailer's low-price status. This relatively inexpensive fix might offer truly low-priced retailers the protection they justifiably desire.

However, our advocacy for disclaimer-based framing has important caveats. First, as we show in our final study, postrefund outcomes can be negative for a disclaimer-based framing if information-focused consumers suspect that the framing was motivated by the retailer's intention to attract consumers and not by an intention to protect them. Second, given that information-focused consumers are primarily attracted to low-price signals for their informational value, they might not be attracted to disclaimer-based signals in the first place. If this occurs, a disclaimer-based framing might not be useful. Although this is possible—and further research should investigate possible prepurchase effects of disclaimers—we note a potentially mitigating factor for a disclaimer's undesirable prepurchase effect.

Consistent with Schwarz's (2006) situated cognition perspective, our results indicate that consumers adapt their signal focus to the specific framing in question such that even information-focused consumers view a disclaimer-based guarantee in a protective light. Although we cannot predict with much confidence, and further research needs to verify this, we speculate that this adaptation of focus might make the disclaimer-based guarantee attractive for these consumers. This effect is especially likely when consumers have other reasons to like the retailer, when there is some purchase urgency, and so on. If further research does find a disclaimer-based framing to make the signal less attractive for information-focused consumers, retailers face an interesting dilemma. Should they offer an explicit or implicit guarantee, which can potentially backfire after purchase, or should they offer one with a disclaimer that can prevent such backlash while reducing prepurchase attractiveness of the signal?

Finally, our findings present a conundrum. We offer a potentially easy way for retailers to avoid postpurchase negative outcomes, which should benefit retailers that try to offer low prices and issue guarantees that are genuine in that sense. However, high-priced retailers might unduly exploit disclaimers to their advantage. Such retailers might attract consumers with a low-price guarantee, betting that most consumers will not look for lower prices. The disclaimer protects the retailer from probable backlash if some consumers find lower prices. Thus, high-priced retailers might abuse the disclaimer-based solution we suggest. Although value-conscious consumers express higher postpurchase search intentions in response to an offer associated with a price guarantee (compared with an offer without such a guarantee), we do not know the degree to which such intentions convert to behavior (Dutta and Biswas 2005). Thus, a concern for abuse remains with the use of low-price guarantees.

Limitations and Further Research

Although we investigated low-price signals only, these findings can potentially extend to any signal that can be interpreted as an informational or a protective device (e.g., satisfaction guarantees, warranties, flexible return policies, money-back guarantees). For such signals, we expect that knowledge of outcome reversibility or actual outcome reversal might not obviate the regret that information-focused consumers feel. Furthermore, the framing and structure of such signals might be suitably molded to blunt the undesirable postpurchase consequences of information focus, particularly by taking trust out of the signal evaluative process, as we have suggested with disclaimer-based framing for low-price guarantees. Thus, for information-focused consumers, the disclaimer essentially makes trust less of an issue in evaluating the guarantee, thereby preventing any sense of trust violation, and thus regret, following postpurchase discovery of lower prices. Further research should investigate whether these effects occur for other signals.

In our designs, we did not incorporate the magnitude of difference between the paid price and the later discovered lower price. Is there a threshold for this difference below which regret does not occur? Does this threshold depend on the product's base price? Further research should investigate these issues. In addition, we focused on a price-related signal, whereas various other kinds of signals, typically in the form of some sort of guarantee, abound in the marketplace. Does signal focus help determine postpurchase outcomes for those signals as well? If so, can they be modified similarly to overcome the disparaging effects of information focus? For example, does product failure following purchase under a strong warranty lead to regret, even after the warranty is redeemed? In addition, low-price guarantees have been investigated for their implications for consumer perceptions of fairness (Kukar-Kinney, Xia, and Monroe 2007), and this research can be extended to postpurchase refunds. Might information-focused consumers who find lower prices after purchase think it is unfair for retailers to issue low-price guarantees? Finally, we have not identified a likely correlate of signal focus that marketers could use to segment consumers. We believe this to be an important goal for further research.

Appendix

Measures Used

Unless stated otherwise, all scale items are anchored by 1 = "strongly disagree" and 7 = "strongly agree."

General Information Focus (Studies 1, 2, and 4)

1. By giving a Low Price Guarantee, a retailer mainly informs consumers that its prices are the lowest in the market.
2. If a retailer is not extremely confident of informing consumers that it charges the lowest prices in the market, it would not offer a Low Price Guarantee.
3. I am primarily attracted to a retailer that offers a Low Price Guarantee because I feel confident that the prices I would pay to this retailer are the lowest in the market.

General Protection Focus (Studies 1, 2, and 4)

1. By giving a Low Price Guarantee, a retailer mainly promises that it will protect consumers from fluctuating market prices by paying them a refund if they found a lower price elsewhere.
2. An LPG-offering retailer may not necessarily have the lowest price in the market, but the retailer will protect consumers financially if they find a lower price.
3. I am primarily attracted to a retailer that offers a Low Price Guarantee because I feel confident that in case I find lower prices in the market I will be financially protected by the refund.

Choice Regret (Pilot, Studies 1 and 2)

1. You feel sorry for choosing to buy the (product name) from this retailer.
2. You regret choosing this retailer for your purchase.
3. You wish you had not chosen to buy the tires from ABC Auto-Mart. (additional item in Studies 3b and 4)

Search Regret (Pilot, Studies 1 and 2)

1. You regret for not looking around for a better price than this retailer in the first place.
2. You wish you had checked more stores for better prices for the tires before buying from ABC Auto-Mart. (additional item in Studies 3b and 4)
3. You feel sorry for not searching around more for a lower price for the tires before buying from ABC Auto-Mart. (additional item in Studies 3b and 4)

Repurchase Intention (Pilot, Studies 1, 2, and 3b)

1. If you need an electronic product in the future, how likely are you to try this retailer?
2. If you ever purchase a digital camera (tires) again, how likely are you to buy it from this retailer?
3. How likely are you to revisit this retailer for your shopping needs?

Retailer-Specific Information Focus (Studies 2 and 3b)

1. By giving a price guarantee, ABC Auto-Mart mainly informs consumers that its prices are the lowest in the market.
2. If ABC Auto-Mart is not extremely confident of informing consumers that it charges the lowest prices in the market, it would not offer a price guarantee.
3. I would be primarily attracted to ABC Auto-Mart's price guarantee because I feel confident that the prices I would pay to this retailer are the lowest in the market.

Retailer-Specific Protection Focus (Studies 2 and 3b)

1. By giving a price guarantee, ABC Auto-Mart mainly promises that it will protect consumers from fluctuating market prices by paying them a refund if they found a lower price elsewhere.
2. ABC Auto-Mart may not necessarily have the lowest price in the market, but the retailer will protect consumers financially if they find a lower price.
3. I would be primarily attracted to ABC Auto-Mart's price guarantee because I feel confident that in case I find a lower price in the market I will be financially protected by the refund.

Trust Violation (Studies 2 and 3B)

1. I felt that the trust I had placed on ABC Auto-Mart was violated.
2. I felt "let down" by ABC Auto-Mart.
3. I felt that ABC Auto-Mart took advantage of the trust I had placed in their price guarantee.

Opportunistic Signaling (Study 4)

1. ABC Auto-Mart offers a disclaimer to attract consumers despite knowing that their prices are not the lowest in the market.
2. ABC Auto-Mart cares more about attracting people to its store than about providing the lowest market prices.
3. ABC Auto-Mart uses its disclaimer as a trick to attract people to the store.

Stimuli for Signal Focus Manipulation (Studies 2 and 4)

Information focus: Imagine that you have come across an MP3 player priced at $149.99 at a local Best Buy store. Best Buy guarantees that if you find this same model for a lower price (say, $129.99, i.e., a price difference of $20) then Best Buy will refund you 110% of the difference, i.e., $22 (i.e., $20 + 10% of $20). This practice is called Low Price Guarantee and its primary purpose is to inform consumers that of all the retailers carrying the product, the retailer offering the price guarantee is charging the lowest price. At *Consumer Reports* we interviewed a large sample of consumers. All of them said that whenever they see a price guarantee they infer that the retailer's prices are the lowest in the market. This inference makes them want to shop at the retailer who offers a Low Price Guarantee.

Protection focus: Imagine that you have come across an MP3 player priced at $149.99 at a local Best Buy store. Best Buy guarantees that if you find this same model for a lower price (say, $129.99, i.e., a price difference of $20) then Best Buy will refund you 110% of the difference, i.e., $22 (i.e., $20 + 10% of $20). This practice is called Low Price Guarantee and its primary purpose is to protect consumers from fluctuating market prices. At *Consumer Reports* we interviewed a large sample of consumers. All of them said that whenever they see a price guarantee they feel protected from fluctuation of prices in the market, knowing that even if they find a lower price later, they will not lose money. This sense of protection makes them want to shop at the retailer who offers a Low Price Guarantee.

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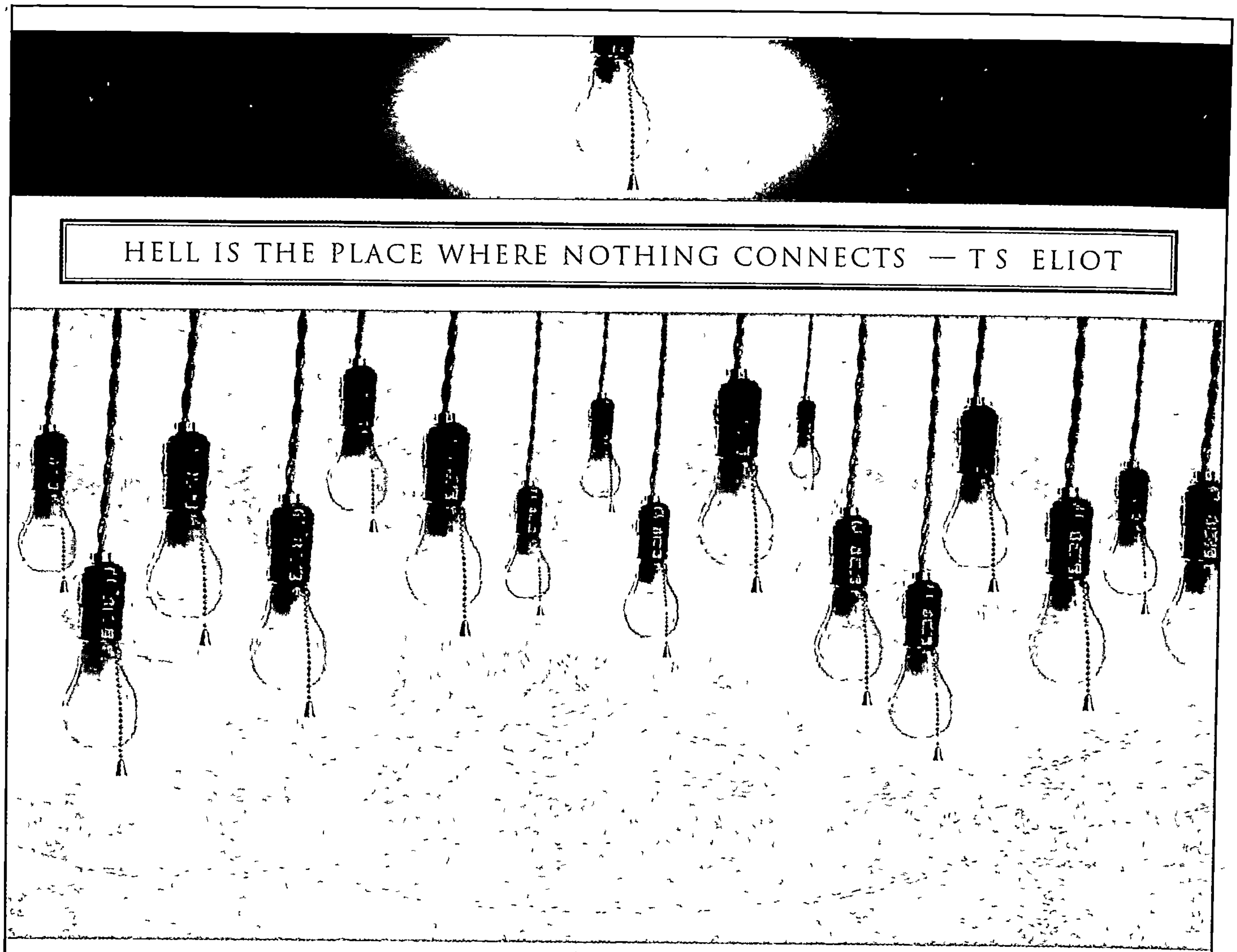
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